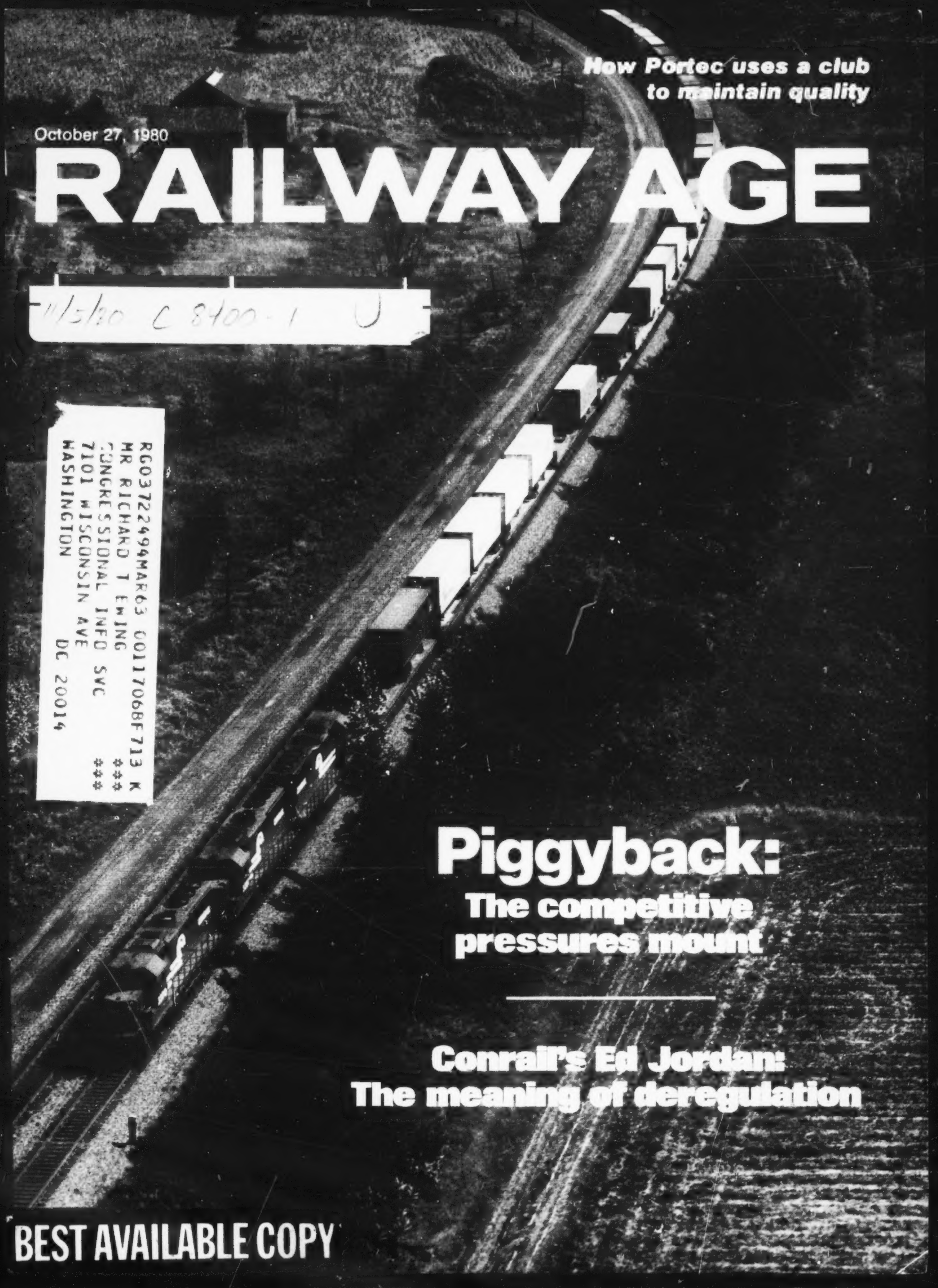

How Portec uses a club to maintain quality

October 27, 1980

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Piggyback:

The competitive pressures mount

Conrail's Ed Jordan: The meaning of deregulation

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RAILWAY AGE

USPS 449-160

October 27, 1980 • Vol. 181, No. 20

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212/966-7700

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Published semi-monthly by the Simmons-Boardman Publishing Corporation, 508 Birch St., Bristol, Conn. 06010. Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico, $10 one year, $16 two years, all other countries $25 one year. All other sub-subscribers in the U.S., Canada, and Mexico, $20 one year, all other countries, $40 one year. All subscriptions payable in advance. Single copies $1 plus postage and handling except special issues. Copyrighted © 1980.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010. Change of address should reach us three weeks in advance of next issue date. Send old address with new enclosing, if possible, your address label. Post Office will not forward copies unless you provide extra postage.

Member of

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA 18301. Controlled circulation postage paid at East Stroudsburg, PA and at Bristol, CT.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010

Inside

LUTHER S. MILLER

THE CONRAIL SUCCESSION

"What kind of man would you like to see succeed you as head of Conrail?" We put the question to Edward G. Jordan at the end of a recent interview during which Conrail's incumbent chairman and CEO had candidly discussed the successes and the failures of his five years in railroading's toughest job (p. 33).

Jordan pondered the question, and replied thoughtfully: "A better man. One should not have put as much of his life into a situation such as this without hoping that it's going to be more successful when he leaves than when he was here, and that's how I feel. I would like to think that there is a skilled manager with significant railroad experience at the CEO level available to take this job, despite all the problems associated with it."

A few days later, Conrail's board announced that this man had been found. He is L. Stanley Crane, who has just retired as chairman and CEO of the Southern and who will take over the Conrail post Jan. 1. (Jordan announced several months ago that he would leave Conrail next year to become dean of Cornell University's Graduate School of Business and Public Administration.)

Stan Crane is an industrial engineer who has been called "the Renaissance man of railroading" because his expertise spills over into so many areas of the business. Presiding over the renaissance of Conrail will not be the easiest task he has ever undertaken; but finding a man with better credentials for that task would be hard.

SPRINGROSE: "IF I WERE RUNNING A RAILROAD..."

There are two or three industrial traffic officers who, through innovative leadership, have achieved eminence in the transportation field comparable to that of the top transportation CEO's themselves. One of these is James V. Springrose, who recently announced that he will retire next Feb. 1 as vice president-transportation of Cargill. Springrose says he plans to do "some transportation consulting" after retirement, and well he might, because he has quite a track record on quite a fast track: The Springrose mark is on annual volume rates, on Rent-a-Train, on shipper supply of covered hoppers in quantity for grain movement. In each case, both carriers and customers have gained.

What views will Springrose bring to transportation consulting? "If I were running a railroad today," he says, "I would give immediate attention to three things. First, I would expand the authority of the marketing department in deciding how to run the railroad. Marketing people should know what the best return on investment is on any given mix of traffic. Therefore, they are better positioned to establish service priorities than the operating department. Second, I would concentrate a great deal of effort in determining what I would want the system to look like in 10 years. Finally, regarding maintenance and rehabilitation, I would concentrate heavily on reinvesting earnings and other available capital into rifle-targeted areas that would achieve the greatest productivity gains. And by productivity, I mean better utilization of all the railroads' assets, whether they be fixed or rolling or personnel."

Springrose concedes that this may be "a broad simplification. Some railroads are already using these management approaches." But "some" is not all, and that's one reason Jim Springrose's post-Cargill career could be as interesting as the one he's had, for 34 years, with the Minneapolis-based company.

RAILWAY AGE
October 27, 1980

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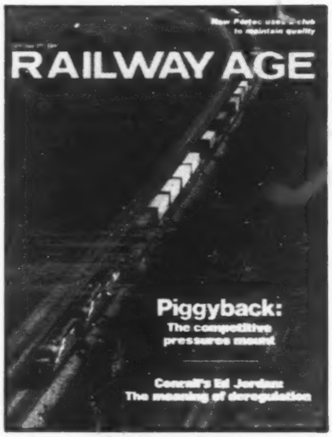

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Piggyback: The competitive pressures mount

Conrail's Ed Jordan: The meaning of deregulation

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Trucking deregulation has produced a rash of rate-cutting by traffic-hungry motor carriers that could do short-term damage to the railroads' carefully structured pricing/service strategies. But no long-term losses are foreseen. Meanwhile, piggyback is doing unexpectedly well in a recessionary year.

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COVER: Conrail run-through piggyback train in lakes region of upper New York

Illinois
Central
Gulf

Piggyback:

The competitive pressures mount

By FRANK MALONE
Associate Editor

For promoters of railroad intermodal service, recovery from the recession is a sufficiently worrisome problem. That recovery, however, must now come in a competitive situation somewhat tougher than in prerecession days and one that may not be fully understood until many postrecession days have passed.

One reason is truck deregulation. There is broad agreement in Washington—at the Association of American Railroads, at American Trucking Associations, at the ICC, and at the Department of Transportation—that over the long haul the deregulation of motor carriers will not cost the railroads significant chunks of piggyback traffic (see next page). One railroad economist, in fact, believes it may even give TOFC a boost. He points out that "Right now, under Teamster contracts, railroads get only overflow highway traffic. But with the easier entry into trucking that deregulation makes possible, we're going to see a lot of smaller truckers in the business who are not bound by Teamster contracts."

Out in the field, however, there is considerable apprehension for the short range. Dropping in after the bottom had dropped out of the business, truck deregulation also arrived just as some railroads had finally put together the service/pricing/equipment packages crucial for piggyback profits. Now those well-shaped strategies seem to face a tougher test from truckers' rate-cutting and easily extended operating authority, as well as faster growth of private carriage, already a big threat. True, there's rail deregulation, too, but it isn't clear yet what that can do for intermodal traffic or how fast.

The impact of trucking deregulation was an obvious concern of piggyback officers at last month's annual meeting of the National Railroad Intermodal Association in Kansas City. Their concern was colored by reports that included few bright spots for 1980 traffic and some railroad comments such as, "We're seeing stepped-up competition from contract carriers as a result of deregulation."

- **The plus factors.** Piggyback's present situation, however, is far from all gloomy.

For one thing, the decline in piggyback traffic during this recession, while serious and damaging, has not been as severe as many expected. "Piggyback traffic normally goes down exponentially during a business downturn," points out Richard E. Briggs, executive vice president of the AAR. "In 1975, piggyback declined at about twice the rate of other traffic. This year the drop has been only about 10%, just about the rate for carload traffic. The reason for this could be that traffic susceptible to movement by piggyback has not declined as drastically as other sectors of the business. But my guess is that it may be due to the rising cost of fuel." In other words, the railroads may, at last, be starting to reap some of the benefits of their inherent fuel efficiency.

So if the recession has hurt railroad intermodal traffic, it has perhaps cut even more deeply into the highway share—so deeply that many truckers may be using deregulation against each other even more than against the railroads. "Remember, there *is* a floor to rate cutting," says an eastern railroad intermodal officer. "Deregulation was not designed to promote the kind of predatory pricing that will put somebody out of business. But we may see that happen."

Adds another railroader: "With business down in general, some of the irregular-route people have dropped into our area and are offering door-to-door rates that beat our ramp-to-ramp. They're offering all kinds of incentives, but obviously they can't keep this up over the long term. When business gets back up, they're going to be somewhere else."

Says a third: "Right now we have intensive truck competition because of the surplus capacity caused by slow business, and it's reflected in their pricing. But we don't think this will last. Some of those truckers are going to fall by the wayside. Right now, where one falls, two come in, and it's a shakeout process."

Thus, railroads don't seem likely to take drastic measures to meet the immediate threat, especially if doing so would upset long-term strategies that have been so carefully constructed. "You could make hasty decisions now that would be very detrimental later on," says one TOFC marketing officer.

Hoping that the real testing ground—a general business recovery—is not far off,

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Will truck deregulation hurt TOFC traffic?

Every Monday since that week in July when President Carter signed the Motor Carrier Act of 1980, Conrail has checked the *Federal Register* and found more of its shippers applying for rights to expand their trucking operations or begin new operations. The shippers are taking advantage of the intercorporate hauling rule in the trucking deregulation bill, under which companies that truck their own goods can pick up a low-cost backhaul for somebody else. Conrail's first worry is that the backhaul rule can make private carriage increasingly attractive to big shippers. But there is also a chance that expanded trucking service, no matter who owns the trucks, will draw away some rail freight—particularly from TOFC shipments, where shippers are already geared up to load and unload trailers.

The expansion of the trucking business following deregulation—and the rate wars that have already begun—will probably have more impact on piggyback than on anything else in the railroad business, says David Paxson, intermodal economist for the Association of American Railroads. But the impact will be only slight, he says, especially over the long haul. He predicts that most of the new private carrier traffic will come from other trucking business.

Furthermore, Paxson and other economists feel that substantial rate-cutting will be impossible for the trucking industry, and that the $5-8 billion in annual consumer savings promised by politicians is implausible. The rate-cutting (and trucking bankruptcies) of the last few months, as well as the recent decline in piggyback traffic, have probably been due more to economic recession than to new competition, Paxson believes.

● **Truckers see little change.** The American Trucking Associations, which was loath to surrender its cloak of regulation and is still grumpy about the bill, expects no more good to accrue to trucking in this area than in any other. Economists at the ATA predict that a "dynamic equilibrium" will be maintained between modes, with some shift between geographic areas and in particular commodities but little net change.

"I think we're really straining here to say there will be a diversion," says ATA Senior Economist Richard Staley. "I really don't see where motor carrier reregulation is going to have much effect on piggyback volumes." He points out that the average trip length for private carriers has been half that of for-hire carriers, so the new trucking opportunities will come over routes that have been considered too short to be economical for TOFC.

One area where deregulated truckers are likely to try to squeeze out a little fat and cut rates is in less-than-truckload (LTL) movements, which in recent years have been more profitable than truckload shipments. This profitability has encouraged the growth of freight forwarders and shipper associations, which consolidate these small shipments into trailers and often consign them to rail for the line-haul portion of their movement.

How serious a problem to TOFC would more LTL competition be? Railroads have been working to improve TOFC reliability in order to attract the very service-sensitive LTL business, and today LTL freight may make up as much as half of the piggyback volume carried by a railroad, according to Charles Yardley, a consultant who worked with the Federal Railroad Administration on an intermodal freight study. Yardley and others caution, however, that because railroad manifests don't detail the loads in trailers it is impossible to say exactly how much LTL traffic the railroads carry.

"The whole market is getting more competitive, so if TOFC doesn't improve as fast as the other modes it will fall behind," says Richard Klem, who has monitored trucking deregulation for the ICC's Office of Policy and Analysis. "It's not speed but reliability that's got to improve. If the railroads can guarantee delivery within a pretty small window, then piggyback has got real potential."

Intermodal marketers seem to agree that after things settle down, railroads may have the chance to win back any lost traffic by realizing the potential for cost savings in TOFC. "The trucks will be looking around for ways to get a competitive advantage over other trucks, and going piggyback could be the answer," says one rail marketer.

● **One for TOFC.** The trucking deregulation bill included one clause designed to help TOFC a little bit: A motor carrier with authority to serve both end points of a shipment can now substitute rail movement anywhere along the line-haul route, and no longer has to interchange along its regular route.

While the Motor Carrier Act may give trucks a chance to price competitively for TOFC business, the new rail deregulation bill gives railroads a chance to fight back, under the provision that allows the ICC to exempt from regulation the rail portion of a continuous intermodal movement. And if the railroads are interested, it will be easier under the rail bill to draw up contracts with truckers playing the pickup-and-delivery role of shipper.

The ICC, which has by fiat blocked growth of railroad-owned trucking operations, now seems inclined to remove such restraints, and this could open up new areas of intermodal transportation. "I suspect the agency, considering the current cast, would be willing to look again at the issue of liberalizing the right to acquire trucking companies," says Edward Guthrie, chief of the operating rights section in the ICC Office of Proceedings. "But as an administrator, I prefer to respond to a request from a carrier, which we haven't had, rather than address the question in a vacuum."

Because railroads and trucks are handled by different committees in the House of Representatives, it proved too difficult to steer intermodal freight deregulation through Congress using the Motor Carrier Act as a vehicle. But Senate Commerce Committee Chairman Howard Cannon (D.-Nev.) and Surface Transportation Subcommittee Chairman Russell Long (D.-La.) seemed fairly keen on clearing the way for growth of "total transportation companies,' and hearings on intermodal deregulation are expected next year.

"Now that Congress has addressed airlines, trucking, and railroads," says one rail official, "the next thing to consider should be deregulating intermodal transportation."

—Tom Kizzia

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most railroads seem willing to forego any short-term response to mounting truck competition. "It's a very unsettled situation," says one railroader.

● **Basic issue: Service.** Far from unsettled, however, are the strategies of some railroads whose piggyback planners see the current threat as not much different from what rail intermodal has always faced. The basic issue was, is, and will be service, they say, and no rate reduction can make up for poor service. In a way, their reaction is an echo of the trucker response to the earlier touting of piggyback fuel efficiency in the "energy crisis." Truckers argued that rail service would not automatically improve just because fuel-related costs would stay lower than those for the competition. Or, as one of the NRIA speakers put it, "Many of us were deluded by the energy shortage. The railroads were not exactly overwhelmed by new business."

Rail intermodalists, of course, believe that their mode does indeed have a fuel advantage. But service remains the greatest concern. That's especially true on the

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Trailers and containers loaded in piggyback service* 1972-79

Year	Plan I	Plan II	Plan II½	Plan III	Plan IV	Plan V	Subtotal	All other plans	Grand total
1979	334,850	203,391	1,563,465	482,684	346,255	101,721	3,032,366	167,580	3,199,946
1978	318,747	230,334	1,544,133	423,680	337,963	103,253	2,958,110	219,181	3,177,291
1977	281,022	216,855	1,431,568	363,814	273,143	84,348	2,650,750	148,889	2,799,639
1976	188,077	229,224	1,323,165	300,088	207,970	70,700	2,319,224	186,449	2,505,673
1975	119,453	255,339	1,215,283	199,625	163,101	71,687	2,024,488	186,447	2,210,935
1974	157,187	423,775	1,462,199	196,159	184,160	76,194	2,499,674	222,780	2,722,454
1973	183,278	488,585	1,425,746	147,061	196,534	67,823	2,509,027	209,301	2,718,328
1972	160,741	507,402	1,182,332	82,295	144,155	58,727	2,135,652	231,326	2,366,978
Plan as % of total 1979	10.5%	6.4%	48.9%	15.1%	10.8%	3.2%	94.8%	5.2%	100.0%

*Figures do not include empty trailers or containers originated that moved on revenue charges including those which under tariff had been assessed revenue charges for the loaded and empty return movement

Source Car Service Division AAR

two railroads with the largest shares of overall rail intermodal traffic—Conrail (18%) and Santa Fe (13%).

"The big thing to sell is dependability," says Martin A. Brieschke, Santa Fe manager-intermodal sales and service. "We're confident that we can compete in terms of service, and with rail deregulation we'll have the ability to react in terms of price."

Santa Fe's intermodal traffic this year is expected to show a 4-5% gain over 1979 volume, making this railroad one of the few with an increase for 1980. "If these irregular-route people were not cutting rates, we'd probably be doing better," says John H. Beck, manager-intermodal pricing. "But I'm not so sure that the price cutting is due completely to deregulation. I think it's largely survival. They're cutting their rates because of the downturn in the economy."

- **Boosting backhauls.** Beck says Santa Fe views contract rates and Plan III (shipper trailers) rates as means of building backhaul business in corridors where the railroad has already proven its service

How shipper agents and associations view piggyback

Railroads, in their effort to keep and develop more piggyback traffic, have two important groups of allies—the shipper agents (who act as intermediaries between carriers and customers, putting together service/rate packages, arranging equipment supply, tracing shipments, and handling billing, all for a small commission) and the shipper associations, whose objective is to consolidate piggyback shipments for better rail service and rates.

Last year, for example, the National Association of Shipper Agents (NASA, now composed of more than 40 agents) accounted for line-haul rail revenue of about $375 million, compared with about $102 million just five years earlier; in those five years, NASA-arranged loadings rose more than 130% (30% in 1978-79 alone). And one of the better-known shipper associations, ITOFCA (Industrial Trailer on Flat Car Associates, based in suburban Chicago), has produced an almost constant year-to-year increase in business for railroads; there were decreases in only two (including 1979-80) of 21 years, both because of economic recession.

Like all good allies, shipper agents and associations have more than a few constructive suggestions and criticisms to offer the railroads. Two representative members of these groups who believe railroads can more than meet the competition from trucks if they will make the necessary improvements are long-time agent Phillip C. Yeager, president of Hub City Terminals, a large Chicago-based agency, and Frank E. Hennig, president of ITOFCA.

- **Better marketing needed.** "I don't think railroads are selling piggyback properly," Yeager says. "Railroads are still more concerned about fighting each other. When one takes business away from another, there is hell to pay. But when a truck line comes in and takes business away, they wring their hands and say 'Oh my God, we lost this business,' but they don't seem to think of what it'll take to get it back."

Yeager is quick to add that shipper agents may not be doing a good enough job, either, but he thinks they've done fairly well. (Some major railroads agree. One eastern road reports that of its 10 largest intermodal customers, six are shipper agents and four of those showed big volume increases for the first eight month of 1980.) Agents also act to meet competitive changes, as Yeager explains: "We recently went out and leased 45-foot trailers to preserve the traffic of one of our largest accounts and one of the largest piggyback shippers. The truckers had come in with piles of proposals, either undercutting rail rates or coming so close that their alleged superior service would get the business. They were also coming in with 45-foot trailers."

Yeager is adamant about longer trailers: "You cannot compete with a 40-footer against a 45 at anywhere near the same price. We were able to lease 45-footers to save that traffic; we were able to react more quickly than the railroads."

- **Something to fight back with.** To Yeager, the current frenzy of truck rate cutting is caused more by recession than deregulation, though he sees a connection: "It's a result of the economic conditions slipping and the need for traffic. Because deregulation is there, the truckers can respond faster than they could before. The railroads need something to fight back with, because they're really being attacked by the trucking industry."

One such weapon is multiple rates, and Yeager cites Conrail (which recently hosted a NASA delegation for a day-long discussion of CR proposals) as a good example of their use. Hub City was the second customer (the first was a freight forwarder) to sign up for Conrail's new 10,000-trailer annual rate plan. Says Yeager: "This will permit us a lower rate so we can compete with truck competition, and it stimulates us to go out and buy or lease trailers (the plan is for non-railroad equipment). Also, Conrail is publishing some rates that we proposed to them on 5,000 trailers a year in rail-owned equipment. We proposed something that will help them get trailers in the superiority. The objective, of course, is to improve equipment utilization, to reduce empty miles.

The rate adjustments usually mean a reduction for the return load. They may also apply to substitution of available equipment for return empty. Or, they may include charges for part or all of the empty miles in a movement.

The ingredients of Santa Fe's intermodal strategy sound a lot like those of Conrail's. CR's director of multimodal sales, Buford Smith, also emphasizes that service is first on the list: "We're preparing for the long term by trying to put together a superior product involving service, terminals, and equipment, as well as price."

Conrail is aiming its pricing thrust toward reducing empty miles, especially by encouraging use of shipper-owned equipment. Says Smith: "Even in contract rates, we're pursuing the Plan III concept. We just came out with a 10,000-load annual volume contract rate only for customers with their own trailers."

Smith also sees Plan III as a means of meeting the threat of private carriage: "We have been burdened by that for many years, and I don't know how much dereg is really going to encourage it. But if we can maintain the service standards that they require and serve the points that they are serving, I think we have a good shot. We're already hauling a lot of private carriage under Plan III."

After an outstanding 1979, Conrail will likely show a 10% drop in intermodal volume for 1980, but the revenue drop will be considerably less, Smith says, adding: "I think we're seeing signs of reaching the bottom in the recessionary trend, and we hope we'll be well into the recovery stage in the first quarter of 1981."

● **NW's "key."** Norfolk & Western has been working hard on the empty miles problem for several years, and since early 1977, its "anchor" policy for containers has been increasingly productive. Allowing container lines and leasing companies a maximum 25% empty in relation to loaded mileage, the policy has paid off. "It has shown more than a $6-million profit improvement through elimination of empty miles," says Reggie Short, NW director of intermodal sales. The key, he says, is to keep tabs on empty miles throughout the system. This computer-aided effort will be expanded next year to include terminal-by-terminal inventory of empty containers.

For the railroad's overall intermodal business (containers currently account for about 50% of revenues), Short thinks some new marketing efforts, soon to be announced, will help NW show a slight revenue increase this year. Main targets will be corridors with backhaul problems.

Even more concerned about backhaul are two railroads that have made impressive gains in shorter corridors. One is Grand Trunk Western, which added a second train to its Detroit-Chicago service right in the face of a deepening recession (*RA*, April 28, p. 34). The train is still on, and business in the corridor is up and lately getting stronger, says James G. Decker, director-intermodal marketing.

GTW's good service-better backhaul strategy also applies to the Detroit-Cincinnati corridor, following the acquisition of the Detroit, Toledo & Ironton (*RA*, June 30, p. 38), in which the first departmental consolidation was for intermodal. In late September, says Decker, volume at DT&I's Detroit piggyback facility was higher than ever before. ⇨

Frank E. Hennig
ITOFCA, Inc.

Phillip C. Yeager
Hub City Terminals, Inc.

right positions to move, and they in turn have helped us with a rate structure that we think will help us compete with trucks."

Directional pricing is being used well by several railroads to reduce empty mileage, says Yeager. "For railroads to price themselves competitively, they have to improve their productivity. That means they can't continue to handle empty trailers thinking they don't cost anything. That's where directional pricing is so important. With that, really all they're doing is meeting track competition and acting like truckers, which is exactly what they have to do to improve productivity."

● **Dereg: Another view.** ITOFCA's Hennig sees truckers making some short-term inroads on piggyback. "The reason is that there are a lot of truckers out there hurting financially. Rather than close the door, they're willing to take some losses, hoping they can survive until things turn around. They are putting in some reductions that are drastic. They're below the present TOFC levels, while the rails are taking their ex parte increases, so there's certain traffic that's eroding."

Hennig believes this will continue until the economy improves enough so that excess capacity is wiped out—or some truckers are, too. But, he added, "With the kind of ease of entry they'll have under deregulation, for every one that fails, there'll be two little guys springing up. And we're not too far away from the point where any independent operator, a one-truck company, is going to be able to have 48-state authority just by blinking his eye. It looks like it could be a real competitive jungle out there with a lot of people who really don't understand what their costs are. They might price it wrong. Competition is going to be such that it's going to drive [the price] down to a very marginal level, and it's going to hurt rail TOFC."

Railroads are fighting back with their own pricing, Hennig says, but he wonders how well can they keep up with competition changing faster than ever before. "When the competition does something that's economically unfeasible, what are you going to do about it? You can sit back and say they're dumb but in the meantime they're handling the business."

ITOFCA itself is looking harder now at truck alternatives, but Hennig emphasizes "alternative" rather than wholesale replacement of rail service. He says the association's members need to know what's available under rules that are subject to daily change.

● **Piggyback profitability.** Hennig believes most railroads will learn how to price intermodal service not just for survival but to show good gains. But he's amazed that some railroads still don't seem to know whether or not piggyback is profitable or how to determine whether it is or can be.

Hennig is as convinced as Yeager is that the 45-foot trailer is crucial: "The motor carriers are just absolutely killing the railroads with 45-foot and tandem trailers. And this is an area where rails have been so reluctant to make progress. It's the same as when all the railroads had 30-foot trailers. They were slow to go to 40-footers. They said, 'If we do, everybody's going to want 40-foot and the others will sit empty.' Meanwhile, the parade is going by. The truckers have this big equipment, and they're stealing the business. They're diminishing the fuel/energy edge that the rails have."

Among bright spots in rail intermodal service, Hennig sees terminal improvements, especially conversion of facilities for mechanized operations. Another good sign is the spreading use of contract rates. ITOFCA recently signed a six-month contract with Milwaukee Road guaranteeing 1,250 trailerloads from Chicago to Minneapolis/St. Paul. The railroad guarantees enough trains a week to handle the traffic.

Loading at Chicago. Conrail is pushing a contract rate for customer-owned trailers.

Illinois Central Gulf, also in the short-haul market, is expanding its "Slingshot" service in the Chicago-St. Louis corridor. A new train will start running in November on the Bloomington-St. Louis segment of the corridor, with Bloomington-Chicago to follow. Bloomington will serve as a "hub center" for industries at Peoria, Decatur, and Springfield, Ill.

"Our goal is to establish 14 hub centers at key locations to provide shippers with line-haul service at a reasonable rate and to recapture freight that has left the rails in recent years," says Peter P. Novas, vice president-automotive/intermodal marketing. Among corridors being considered for the service is Memphis-Louisville.

Novas claims that the recession has not hurt Chicago-St. Louis intermodal revenues: "The route is protected by the number and variety of shippers able to make use of 'Slingshot' and the economic advantages it offers." The main advantage is a reduced rate for the backhaul from St. Louis to Chicago, basically a volume-discount deal.

Another ICG effort is toward LTL shipments under Plan V (joint rail/truck tariff, rail or truck trailers), which eventually may gain enough "credibility" that long-term contracts may apply, says John Donnell, director-intermodal market development. "While the partnership with customers would obtain less revenue per shipment, it would be generating more volume, and that's the key, even if it is made up of LTL shipments," Donnell says.

● **Equipment: The length problem.** As railroad pricing strategies have developed, so have improvements in piggyback equipment needed for the lower-cost operation that makes competitive pricing possible. Developments range from Santa Fe's Ten-Pack train to faster lift off/lift on machinery, in a technology flurry unprecedented in intermodal history (*RA*, July 28, p. 24).

A major attempt—perhaps the first fully coordinated one—is being made to deal with the problems of handling different-length trailers. "For a long time, there's been general agreement among intermodal operations officers that we're having a lot of trouble with nonrailroad trailers," says Gordon A. Volkers, assistant general manager-operations for Chessie at Baltimore. "The problems are increasing in direct proportion to the quantity of nonrailroad trailers being tendered to us, and they vary in severity in direct relation to a trailer's exceeding 40 feet in length."

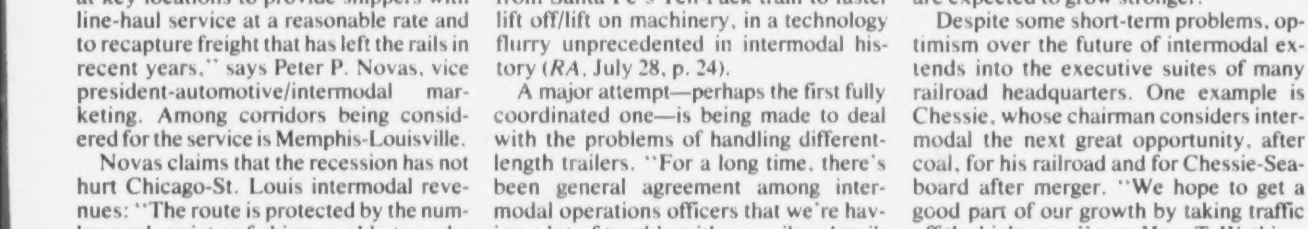
Especially troublesome are trailers with 42-inch kingpins, because most piggyback cars and tractors used for terminal hostling are geared to handle trailers with 36-inch kingpins. Then there's the problem of nose-mounted power units for reefer trailers, which extend 24 inches or more beyond the front of the unit.

When the bodies of trailers with these components are longer than 41 feet, there's real trouble, as Volkers explains: "Such trailers loaded on the 'B' end hitches of most flatcars result in a 6-inch overhang beyond the car deck."

The kingpin/nose-mount problem is considered a serious threat to railroads' ability to handle larger piggyback volumes efficiently—so much so that an ad hoc committee to wrestle with the problem was formed at the annual NRIA meeting. The committee is headed by Volkers and includes representatives of Santa Fe, Conrail, Chessie, NW, Southern Pacific, Trailer Train, and several trailer manufacturers. Volkers says the railroads will keep coping with the length problems of existing trailers, but the hope is that changes can be made for new units.

● **Outlook optimistic.** Despite the current slack and tougher-than-ever price competition, railroad intermodalists are convinced they'll see a traffic surge in the not-so-distant future. New partnerships are being explored, not only with shippers but especially with motor carriers, and especially in view of energy concerns that are expected to grow stronger.

Despite some short-term problems, optimism over the future of intermodal extends into the executive suites of many railroad headquarters. One example is Chessie, whose chairman considers intermodal the next great opportunity, after coal, for his railroad and for Chessie-Seaboard after merger. "We hope to get a good part of our growth by taking traffic off the highways," says Hays T. Watkins. "The way to do it is through some sort of cooperative activity between the railroads and the truckers. The economics are such that there are bound to be advantages for both modes in using piggyback. I am very optimistic that we can attract more intermodal traffic. If we learn how to do innovative pricing, we ought to be able to get a greater share of the intercity market. There's a tremendous market for intermodal service, and I think that's the next big area where railroads have to make a breakthrough. ■



Santa Fe TOFC/COFC train near Fenner, Calif. The road expects a 4-5% gain in intermodal volume this year.

Market

CARLOADINGS

Loadings of revenue freight in the week ended Oct. 4 totaled 458,513 cars, according to the Association of American Railroads. This was a decrease of 27,502 cars, or 5.7%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Oct. 4 are estimated at 18.8 billion, a decrease of 2.6% below the corresponding week of 1979.

REVENUE FREIGHT CARLOADINGS

Commodity	Oct. 4 week	Sept. 27 week
Grain	34,769	32,507
Farm products	5,265	4,415
Metallic ores	28,506	26,906
Coal	117,789	116,609
Crushed stone, gravel & sand	15,171	14,976
Nonmetallic minerals	16,355	15,946
Grain mill products	17,632	17,738
Food and kindred products	18,225	18,992
Primary forest products	18,863	19,256
Lumber & wood products (except furniture)	9,396	9,390
Pulp, paper & allied products	21,122	21,603
Chemicals & allied products	27,561	27,134
Petroleum products	5,529	5,445
Stone, clay & glass products	16,197	16,449
Coke	4,012	4,019
Metals & products	16,442	15,580
Motor vehicles & equipment	17,745	17,461
Waste & scrap materials	12,115	12,023
Forwarder & shipping assn. traffic	12,110	11,485
All other carloads	43,416	43,126
LCL traffic	293	248
Total cars loaded	**458,513**	**451,308**
Cumulative total 40 weeks	**17,402,084**	**18,399,413**
Estimated revenue ton-miles (billions), 40 weeks	**702.1**	**695.8**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Sept. 27 totaled 33,512 cars (13.1% below the corresponding 1979 week) and 60,662 trailers or containers (down 12.1% from 1979). Cumulative volume for the first 39 weeks of 1980 is 1,246,854 cars (down 10.8% from 1979) and 2,269,196 trailers or containers (down 8.0% from 1979).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Sept. 7 totaled 4.3 million tons (down 12.5% from 1979). Cars loaded totaled 60,824 (down 14.7% from 1979). Cumulative loadings for 1980 were up to 180.98 million tons (up 2.8% from 1979).

- *CP Rail.*—Placed an order for 100 89-foot, 100-ton flatcars with Marine Industries. Cost is estimated at $8.5 million.

- *General Electric Apparatus Service Division.*—Received contracts totaling more than $14 million for rehabilitation of rail passenger equipment at its Hornell, N.Y., shop. For the Maryland Department of Transportation, GE will rehabilitate 22 locomotive-hauled cars for $5,462,400 and eight rail diesel cars for $3,456,300. Under a contract with the Port Authority of Allegheny County, GE will rehabilitate 10 locomotive-hauled cars and install diesel-electric head-end power units for $4,065,392, and rehabilitate two diesel-electric units for $1,297,872.

- *New Jersey Department of Transportation.*—Placed a $13-million order with Electro-Motive for 10 3,000-hp, diesel-electric passenger locomotives for use on the Raritan Valley Line. Delivery will begin late in 1981, coinciding with delivery of 57 new push-pull cars previously ordered from Bombardier.

- *Freight cars and locomotives.*—The following report has been received from the AAR and the ARCI:

DELIVERED

	August		July	Eight months	
	1980	1979	1980	1980	1979
Built new by carbuilders	6,158	7,753	5,455	55,730	55,156
Built new in RR shops	836	574	435	4,050	3,776
Built new—total	6,994	8,327	5,890	59,780	58,932
Rebuilt	18	104	4	923	622
TOTAL DELIVERED	**7,012**	**8,431**	**5,894**	**60,703**	**59,554**
Locomotives (new and rebuilt)	108	159	167	1,308	1,112

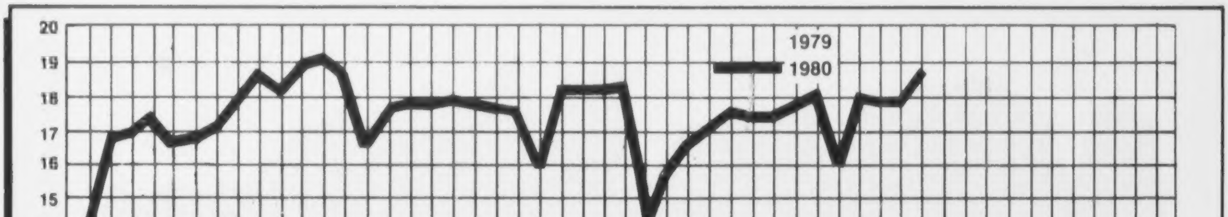
ORDERED

	August		July	Eight months	
	1980	1979	1980	1980	1979
To be built new by carbuilders	2,531	7,519	3,393	27,482	84,482
To be built new in RR shops	266	1,200	0	4,578	3,471
To be built new—total	2,797	8,719	3,393	32,060	87,953
To be rebuilt	194	191	0	1,063	645
TOTAL ORDERED	**2,991**	**8,910**	**3,393**	**33,123**	**88,598**

ON ORDER AND UNDELIVERED

	September 1		August 1	Average backlog	
	1980	1979	1980	1980	1979
To be built new by carbuilders	62,652	117,305	67,934	84,504	112,332
To be built new in RR shops	6,780	6,006	7,350	6,619	5,656
To be built new—total	69,432	123,311	75,284	91,123	117,988
To be rebuilt	240	110	64	354	103
TOTAL ON ORDER	**69,672***	**123,421**	**75,348**	**91,477**	**118,091**
Locomotives (new and rebuilt)	577	723	517	951	1,068

*Due to revision and cancellations of some orders, the backlog has been reduced by 1,655 cars.



New strides in detector technology

November 10, 1980

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Boston: Rail transit's troubled boom town

RAILWAY AGE

USPS 449-130

November 10, 1980 • Vol. 181, No. 21

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Published semi-monthly by the Simmons-Boardman Publishing Corporation, 508 Birch St., Bristol, Conn. 06010. Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S., possessions, Canada and Mexico: $10 one year, $16 two years; all other countries $25 one year. All other subscribers in the U.S., Canada, and Mexico: $20 one year; all other countries: $40 one year. All subscriptions payable in advance. Single copies $1 plus postage and handling except special issues. Copyrighted © 1980.

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Member of

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA 18301. Controlled circulation postage paid at East Stroudsburg, PA, and at Bristol, CT.
POSTMASTER: SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN 06010

Inside

LUTHER S. MILLER

THE EMERGING CORRIDORS

There was a time when "corridor," in passenger train parlance, referred exclusively to that thickly-populated neck of the Northeast stretching from Washington to Boston. But no more. Along came Los Angeles-San Diego and New York-Buffalo, and the success of trains on those routes caused other states to start doing some serious thinking about their own corridors. This led Congress some months ago to order Amtrak and the U.S. Department of Transportation to study "Emerging Corridors" all over the land.

The first results of that study were made public a couple of weeks ago (p. 10). Not surprisingly, Los Angeles-San Diego is at the top of the Amtrak/DOT "10 most likely" list. Also not surprisingly, New York-Buffalo is very near the top.

But it may come as something of a surprise—at least to those who have not followed recent developments in New Jersey—that an Atlantic City-Philadelphia connection ranks No. 2 on the Amtrak/DOT list of corridor candidates.

Put most simply, this is because Atlantic City—which just a few years ago was a last resort for vacationers—has now been reborn as the gambling capital of the East. The slot-machine and roulette aficionados are pouring into Atlantic City by the hundreds of thousands, mostly by automobile because existing rail service is slow, shoddy, and spotty, and gamblers don't like to ride buses. The continuing proliferation of casinos in Atlantic City, and the staggering projections of growth in travel between that city and nearby Philadelphia, have caused city and state planners to ask the obvious question: Why not try to move at least some of these people on high-speed trains? So Atlantic City-Philadelphia is now one of the hottest "emerging corridors" anywhere.

There are two conventional ways that emerging corridors may emerge: (1) with service fully provided by Amtrak, or (2) with states sharing the costs with Amtrak. Both options are now under consideration in New Jersey and in Washington.

But there is a third option in this case. The Atlantic City-Philadelphia route looks so lucrative that at least three private developers are also interested. One of them is the French holding company, Compagnie General Electricite (CGE), which some months ago said it might be willing to invest $100 million in the business of moving people at high speeds between Atlantic City and Philadelphia. Now, the Philadelphia-based firm of Day & Zimmermann has completed a feasibility study for CGE—and has determined that it would be feasible to operate 125-mph express trains, complemented by a separate fleet of commuter trains, as a paying proposition.

The implications of what the French are proposing are, to say the least, interesting. Prospects for the Atlantic City-Philadelphia corridor—and a possible French connection—will be explored by Associate Editor Tom Kizzia in an article in our Dec. 8 issue.

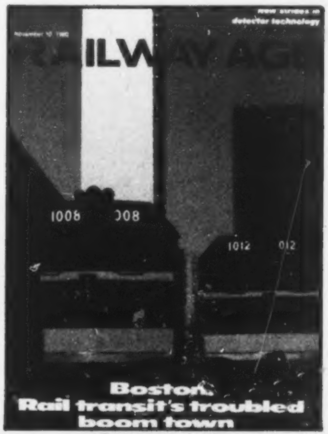
RAIL TRANSIT LOSES A FRIEND

The death of General Electric's Russell L. Bowersox is reported in a brief notice on p. 48. A GE employee for 31 of his 57 years, Russ was a passionate and effective advocate of rail transit at a crucial time in the renaissance of mass transportation as an alternative to paving over our cities with parking lots and expressways. His brilliantly edited (and too-short-lived) magazine, *Going Places*, accomplished enduring good in helping to reorient the thinking of transportation planners toward the steel wheel. Rail transit has lost a good and wise friend.

RAILWAY AGE

November 10, 1980

FEATURES



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16 Boston: Rail transit's troubled boom town
Though hard-pressed for operating funds, MBTA has a big capital account (thanks largely to Interstate Highway transfers) that is paying for $2-billion worth of new construction. One big question for the future: Will commuter rail improvements start to take precedence over rapid transit extensions?

25 New strides in detection technology
"All that wheel-tapping and hotbox-sniffing over railroadings' century and a half represents well-founded alertness to hazards that have still not disappeared," writes Associate Editor John Armstrong. Here he explores the increasingly sophisticated world of detection technology.

36 L&N: Rebuilding for coal growth
Two years ago L&N won a special 22% coal rate increase to help pay for $427.7 million in improvements designed to enhance coal-hauling capability. Of that amount, $73 million was earmarked for track and other fixed-plant work. The program is ahead of schedule, and the results are beginning to show.

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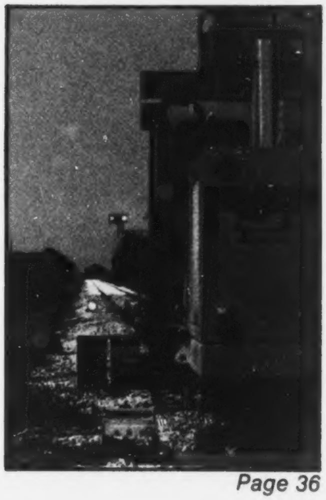

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COVER: MBTA commuter trains at Boston's South Station were photographed by Tom Kizzia.

Corridors rated for passenger rail potential

The intercity corridors with the greatest potential for new or expanded rail passenger service have been ranked by Amtrak and the Department of Transportation in a preliminary report to Congress. More detailed information on the top-ranked corridors will be compiled by next February, at which time Congress is expected to take up the issue of expanding the Amtrak system.

The "Emerging Corridors" study released in October identified four routes with high potential, judged on the basis of the number of passenger-miles travelled per dollar of cost and the number of gallons of gasoline saved per dollar of cost. Amtrak also factored in the interest shown by various states, on the basis of their support for current "403-b" trains; one of the questions before Congress will be whether states will be expected to participate financially in development of new corridor service.

The top four corridors ranked by the DOT/Amtrak study, together with estimated capital investments in fixed facilities that would be necessary, are Los Angeles-San Diego, $18.7 million; Philadelphia-Atlantic City, $21.1 million; New York-Buffalo, $79.2 million; and Los Angeles-Las Vegas, $37.8 million. Equipment costs, which can be shared by the system, were figured separately.

More detailed information regarding ridership potential and costs for these four corridors will be developed for the February 1981 report, which was requested last May by Congress in its Emerging Corridors bill. Further marketing and cost studies will be undertaken to refine the relative rankings of the six next-most-likely routes, Secretary of Transportation Neil Goldschmidt said (see table). He said further studies would not be likely to change the relative rankings of the final 15 routes examined by DOT and Amtrak.

The fate of the bottom 15 corridors on the list is still up in the air, as far as Amtrak is concerned. "It's still a matter for negotiation as to how far down the list we should look in our February study," said one Amtrak official involved in the process. "If they aren't good corridors, we should come up with the data to show it. I'd hate to appear before a congressman and tell him we didn't think the train in his district merited further attention."

While transmitting the ranking to Congress, Goldschmidt took particular note of the report's conclusion that the replacement of existing means of travel with rail passenger service would have an insignificant and in some cases a negative impact on energy conservation.

"Even the best of corridors results in the expenditure of seven dollars for each gallon of fuel saved," Goldschmidt commented. "Furthermore, the energy savings of the rail corridors beyond 1985 may decrease if automobile fuel efficiency improves at a faster rate than for rail." The secretary concluded that benefits other than energy conservation would be needed to justify the upgrading in the corridors.

The "10 most likely"

		Capital costs in FY 1980 dollars (millions)						
Corridor	Miles	Stations	Track	Signals	Grade crossings	Equipment	Composit score*	State commitment factor
Los Angeles-San Diego	127.9	1.4	9.8	4.1	3.4	27	2.81	3.51
Philadelphia-Atlantic City	64.7	.4	15.4	2.3	3.0	17	2.67	3.34
New York-Buffalo	435.4	1.3	70.0	–	7.9	25	2.51	3.14
Los Angeles-Las Vegas	325.5	–	26.7	6.6	4.5	18	2.29	2.86
New York-Albany	142.0	2.8	22.7	–	1.0	18	1.45	1.81
Chicago-Detroit	283.5	.1	75.0	–	19.4	22	1.08	1.35
Washington-Richmond	109.0	.8	10.5	.09	.7	18	1.20	1.20
San Jose-Reno	282.0	–	42.2	–	13.2	18	.96	1.20
Texas Triangle	772.2	2.9	128.6	11.2	99.6	33	1.13	1.13
Philadelphia-Harrisburg	104.0	1.0	33.3	1.1	.7	–	.87	1.09

*Score based on passenger-miles per dollar of cost and gallons of fuel saved per dollar of cost.

Earnings weather the recession

Third-quarter reports show unexpected strength in earnings for a number of railroads. Some sample statements:

—Union Pacific Railroad reported third-quarter net income of $50.8 million on revenues of $526.2 million, compared to net income of $29.2 million on revenues of $442.8 million last year. "The railroad's net income was the highest ever achieved in any quarter in its history," said UP Chairman James H. Evans. "Sharply higher grain and coal traffic, coupled with an intensified cost-control program and the July 12 freight rate increase enabled the railroad to reverse its second quarter decline in earnings." Union Pacific Corp. earnings for the quarter were $118.1 million, up 38% over 1979.

—Santa Fe Industries, Inc., also had the best quarter in its history, with net income of $84.6 million, up 68% from last year. Chairman John S. Reed attributed the increase primarily to a 163% increase in the pretax contribution from rail operations and a 63% increase in contribution from petroleum operations. He said the increase in pretax rail earnings from $21.9 million in the third quarter of last year to $57.6 million this year was due principally to rate increases.

—Norfolk & Western Railway reported record net income of $43.6 million for the third quarter, up 9% from last year, partly because "strong coal traffic, particularly export traffic, helped to offset the continuing impact of the recession on NW's merchandise traffic base."

—Missouri Pacific Railroad had earnings of $26,165,000 in the third quarter, up from $19,669,000 last year. Missouri Pacific Corp.'s earnings for the period were a record $35,763,000, compared with $31,986,000 in 1979.

—Seaboard Coast Line Industries' third-quarter net was $46.6 million, highest for any quarter in its history and up from $30.8 million last year. SCLI Chairman Prime Osborn said transportation revenues rose by 13.4% while transportation expenses rose by only 8.4%.

—Southern reported consolidated net income of $36.2 million for the third quarter, the second highest third quarter on record, exceeded only by the $40.7 million earned in the third quarter of

TENTH IN A SERIES

Railroad technology

DETECTORS

A smarter breed of defect spotters

By JOHN H. ARMSTRONG, Associate Editor

Hotbox detector on the Santa Fe. New trackside devices now in use or under test monitor other types of mechanical failures that can cause costly accidents.

Start with a bottom-line number such as net railway operating income—whether the 1977 nearly catastrophic $343 million or 1979's moderately healthier $794 million—and it's clear that lopping off any significant fraction of such dead-loss payouts as last year's $328 million for freight L&D or $314 million in direct train-accident damage to equipment and track would show up vividly in the ROI percentage for the whole U.S. rail system.

Exactly half of last year's L&D total (*RA*, June 30, p. 34) is in the shadowy "additional damage not otherwise provided for" category. Within the train-accident drain on profits (see table on page 27), there are several specific categories that represent big enough chunks of the whole to suggest that attacking them with doses of modern technology could pay off in more concrete ways than just the general social benefits of a smoother-running, less-dented railroad. Focusing on the $76 million of equipment-failure-caused costs, we find that items amounting to $2 million or more each account for well over half of the total, confirming intuition that savings might in fact support development and deployment costs for specialized detectors if they can in fact find and forestall events that lead to these big-ticket accidents.

Track geometry cars detect likely sources of major accidents, and the ultrasonic/magnetic rail inspections conducted by today's fleet of detector cars certainly fit within any broad definition of "detector." So do many items of factory or shop quality-control and inspection equipment; block signals detect the presence of trains to allow safe operation of the railroad. However, this review of some of today's developments in "detector" technology is arbitrarily confined to *the use of sensors in the field to detect mechanical conditions in rolling stock that may lead to a train accident*—usually, derailment—*from a sudden failure or event*.

• The stake in detector deployment. Reportable accident damage includes only direct costs of repair or replacement of rolling stock and track. Railroad costs for operational delays, detouring and other disruption, damage claims for lading, and any societal costs are not included, nor is there any allowance for wreck clearing, casualty, compensation, or such indirect effects on the railroad balance sheet as loss of competitive position in the transportation marketplace. Their $313-million total is more than the tip of the proverbial iceberg (if nonreportable wreck costs were in fact seven or eight times that big, there would probably be no railroads left to worry about by now). But we do know that the L&D payout for train accident damage to lading last year was $86.3 million, and in some studies of potential savings from accident reduction the FRA has postulated a three-to-one ratio of total to reported costs. For individual derailments where hazardous materials are involved, the ultimate total cost limit is in fact very near the sky, as the current investigation and prospective litigation on the Mississauga hotbox/derailment/evacuation dramatizes.

As the table shows, a few specific items account for a very significant fraction of the total. All that wheel-tapping and hotbox-sniffing over railroading's century and a half represents well-founded alertness to hazards that have still not disappeared. Running-gear components account for the vast majority of equipment-caused derailment costs; at the same time, perspective requires the observation that some *17.4 million car-miles were run for each of the 1,815 equipment-failure accidents*.

There is a definite limit to the frequency, intensiveness, and expense of *profitable* surveillance, and any false-alarm rate that adds significantly to train delays can quickly price a technology out of the market. Within the $46.4-million "other" cause category are additional major items worth considering in connection with "detector" possibilities: shifted, improper or falling loads—$8.8 million; lateral/vertical force interactions—$5.8 million; obstructions on track, natural or otherwise, $5.5 million. Add in the $42.6 million in accident damage attributed to rail and joint bar defects, and a reasonable guess at the total tab for accidents associated with mechanical-part problems in keeping those flanged steel wheels carrying commerce over those steel rails could be $200 million to $300 million a year.

● **From the wayside...** Slow-developing difficulties such as worn-wheel contours are found rather adequately by inspection and gauging as indicated by the relatively low toll ($2.2 million) they exacted in 1979. For much of this inspection, rolling the train past trained eyeballs, as at the hump inspection pit, is the cost effective way to go.

Failure modes that develop only or mostly on the main line are something else again. Granddaddy of the more formal wayside inspection devices is probably the break-bar dragging equipment detector (DED) installed by the Pennsylvania Railroad in quantity prior to World War II and still in service at some Conrail locations. Cast iron bars—carefully de-

At Pueblo: Probing the principles of defect-spotting systems

Alongside the 14-mile Railroad Test Track loop at the Department of Transportation's Pueblo facility (with its own double-ended research siding) sits the well-instrumented research van of FRA's Wayside Detection Research Facility. Operated by the Office of Research and Developments system management contractor, Aerospace Corp., the WDRF has been set up under a multiyear program initiated in 1977 in response to Administrator Sullivan's expressed concern for detection of defective rolling stock components that contribute to accidents.

Initial planning called for about $2-million-a-year federal support of this program, but that figure has been cut by about 60%, and the program to demonstrate the CAR-SCAN (Composite Analysis of Railcar Safety and Components with Automatic Notification) concept has been stretched out to 1983.

The CAR-SCAN project is an example of FRA's effort to encourage industry to develop individual sensor/detector components and subsystems whose signals can be integrated into microprocessor-analyzed outputs that will make inspection of passing trains more economical by detecting a wider variety of potential hazards than is now feasible. For this purpose, commercial hot wheel, electronic dragging equipment, ultrasonic cracked-tread, hotbox, and wheel flange/loose wheel detectors have been installed for testing on a rag-tag collection of freight cars that have such defects.

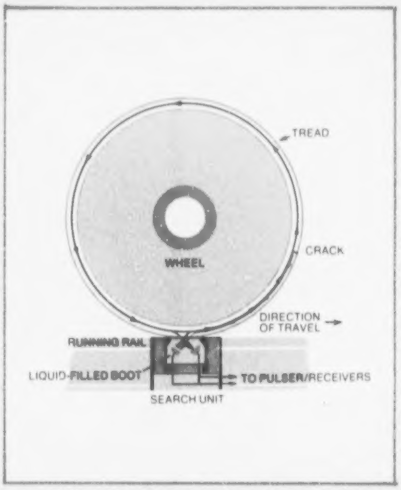
FRA is scheduled to report in this fiscal year (1981) technical characterizations of three detector principles as embodied in current hardware:

—*Cracked-tread detector*. This is the WHeeLFAX system for ultrasonic scanning of passing wheels (see diagram) developed by Scanning System, Inc. (now FAX Corp.), of Danbury, Conn.

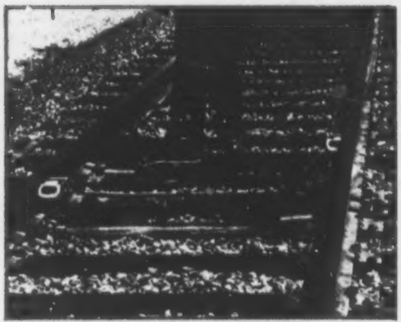
—*Flange detector*. This is the Marine Electric Railway Products Division's multifinger electromechanical "Wheel Checkers" system for detecting missing flange segments and loose or displaced wheels.

—*Cracked-plate detector*. This is an FRA/Aerospace WDRF embodiment of a mechanization of the time-honored carman's hit-it-and-listen inspection studied at the University of Houston under previous FRA contracts, with lab-type acoustic spectrum analysis gear feeding into a minicomputer programmed to detect wheel plate defects (see photo).

BRAKING INSPECTION SYSTEM sensor. Optical wheel locator correlates motion over sensor with vertical and longitudinal force measurements from displacement of rail segment within the sensor.



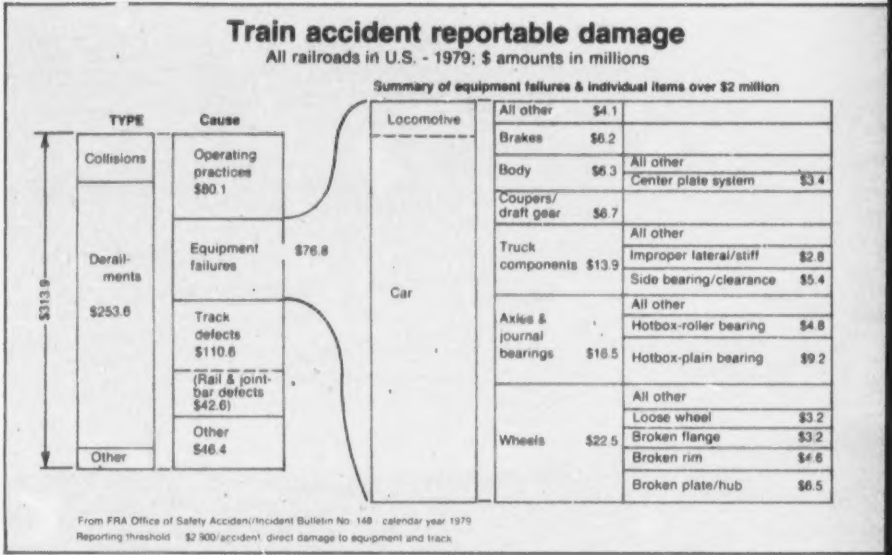
CRACKED WHEEL TREAD DETECTOR. A transducer mounted in a special measurement rail injects an ultrasonic signal at the wheel tread, which propagates around the running surface and is received by a second transducer. Depending upon crack size, a crack in the tread will reflect some or all of the injected signal to a receiver in the first transducer. Sensor system logic will determine if the wheel is good (no reflected signal), has an alarm-level crack (partially reflected signal), or has a calamity-level crack (fully reflected signal).



AUTOMATIC WHEEL IMPACTOR used in exploratory development of Cracked-Plate Detector system. Passing wheels flip hammers in the manner of a trap drummer's foot pedal, striking wheel plate to generate sound picked up for good-bad analysis by microphones (not shown).

● **Ultimately—train dynamics?** Farther down the line is the Braking Inspection System (BIS) exploratory development, a system for measuring wheel-rail vertical and longitudinal forces on a passing train in real time. A Transportation Systems Center (Cambridge, Mass.) program with sensor system development by contract with Novatek, Inc., of Burlington, Mass., the BIS uses movement of a section of running rail as measured by linear variable displacement transformers to determine not only single-wheel vertical forces (in the manner of a weigh-in-motion scale) but longitudinal braking forces as well (see photo). At its present state of development it can detect "anything qualitatively out of line" in braking system performance at up to 20 mph and has withstood wheels passing over it at 60 mph with unanalyzed indications that data-taking at such road speeds may be possible.

Obvious possibilities include detecting struck or unreleased brakes and overloaded or eccentrically loaded cars, and wheel-rail force measurements (perhaps including lateral forces) on a real-time, routine basis. BIS might ultimately interact with insights from the Track Train Dynamics program in attacking incipient tendencies toward derailment via dangerous L/V force ratios from whatever cause—track geometry, train handling, train makeup, or suspension design and maintenance—as well as inspecting for failed or maloperating components.



From FRA Office of Safety Accident/Incident Bulletin No. 148 · calendar year 1979
Reporting threshold · $2,900/accident, direct damage to equipment and track

The damage threshold separating "train incidents" from "train accidents" in FRA reporting, until now adjusted for inflation at two-year intervals, went from $2,300 for 1978 to $2,900 for 1979, accounting in part for a 13.6% decrease in the number of accidents despite a 6.5% increase in revenue ton-miles. Total accident cost, also affected by the threshold change (but less strongly so) and not adjusted for inflation, increased only 2.9% (from $305 million to $313.9 million). For the first time in several years, an actual decrease in accident cost per unit of traffic is indicated.

signed to resist fracture from ice clinging to trucks and underbodies but to break when struck by any dragging hardware substantial enough to do structural damage or cause a pile-up—check areas between and beside the railheads at locations approaching tunnels, bridges, and interlockings, where a derailment will have particularly expensive connotations. When these bars are connected in series with appropriate signal circuits, actuation brings trains to a timely halt for inspection.

Development in DED's has proceeded in both directions since then. Opting for economical proliferation, the Denver & Rio Grande Western has installed homemade detectors consisting of a signal circuit wire wrapped around wood lath at each intermediate-signal location on its ctc-equipped main lines. Fracture illuminates a purple aspect at the location, observable from the train in time for an inspection stop before passing the next turnout. In particularly critical canyon areas (also of course protected by extensive side and overhead slide-detector-fence circuits) DED's may be located at intervals as close as a quarter mile, with their signal aspects giving a watchful crew a good idea of where in the train any actuation originates and so reducing the walking and delay after the stop.

In the direction of greater sophistication, latter-day commercial DED's such as the WABCO/Union Switch & Signal SRD-5 are self-restoring; a stout transversely pivoted detector plate flaps over when struck in either direction, breaking the signal circuit. An adjustable spring force provides sensitivity appropriate to the location and returns the detector to its vertical position after actuation. The most recent survey of detector installations conducted by Committee F of the AAR's Communication & Signal Division (1972) found 1,859 installations in service on railroads in the U.S.

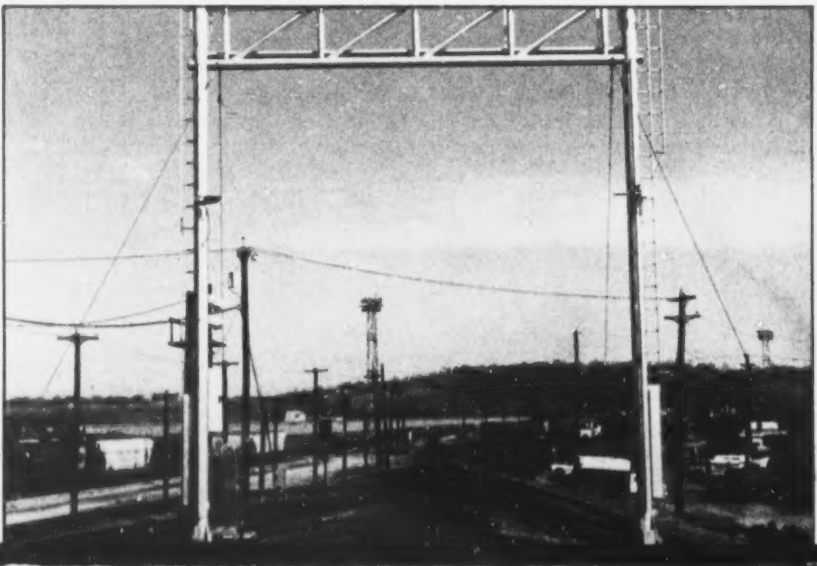
Under extreme snow and ice conditions, particularly at high altitudes, moving-part DED's may have problems. Oregon Technical Products (Belmont, Calif.) has introduced its RT-200 Impactor, which senses impacts on its rigid, track-mounted sensor enclosure (fabricated from 1/4- and 5/16-inch steel plate) by acoustic ("earphone") accelerometer outputs, suitably amplified. One MoPac installation was wiped out when a train derailed directly on top of it; other ruggedness complaints are reported minimal.

It is possible for dragging items directly over the railhead, such as brake hangers, to pass through the necessary gaps in mechanical DED sensors; an as-yet-unnamed optical DED system being developed by Marine Electric Railway Systems Division (Brooklyn, N.Y.) uses a light beam immediately above the rail, gated off and on by each passing wheel, to do the job without this gap. A prototype is located at the Transportation Test Center's Wayside Detector Research Facility (see facing page).

● **Hitting light beams instead of bridges.** Detecting loads or cars made oversize by load shifting or misrouting before they enter a restricted zone would seem to be a straightforward job for a light beam and modern sensing circuitry, and high- and/or wide-car detectors are a part of the scene at appropriate check points. Florida East Coast maintains wide-load detectors at alternate wayside detector locations on its main line, thus checking clearances at about 45-mile intervals.

The railroad job is not quite as simple as opening doors in a supermarket; under heavy rainfall conditions, water pouring from the roofs of high cars may result in an occasional false alarm. A redesigned version of the high-wide detector system developed by Erico Products is now Harmon's CCD-1 car-clearance detector with all solid-state electronics. Many systems are of an ad hoc nature, assembled by railroad signal departments to meet their

Harmon CCD-1 Car Clearance Detector uses an interrupted light beam to check height, width or shifted load, and top corners of passing cars. Receiver operator can shift the mode to COUNT for car counting or WALK-THRU to detect unwanted cars in a yard area.



Suppliers are adding to and updating the most widely used detectors—infrared hotbox scanners and their readouts.

own particular situations.

The largest single-component contribution to train-accident cost is the $22.5 million from wheel defects. Somewhat more than a quarter of this is attributable to wheels with broken flanges or loose on the axle. Based on patents going back almost 30 years, the "Wheel Checkers" multifinger electromechanical detector, which literally feels passing wheels, was in use at over 200 points by 1972 and has continued to increase in numbers as part of the Marine Electric line since 1975. The installations are typically located at yard entrances or other points where the 15- or 25-mph limitation they pose (there are two models, with different finger dynamics for the two limiting speeds) is acceptable. With a guard rail opposite its array of 124 sensing fingers to position the wheel set, it can detect loose-wheel slippage in either direction and any broken-out or missing flange segment more than about a half-inch deep for 3½ inches or more along the circumference. At a cost about half that of today's boxcar, many users consider it well worthwhile.

AAR C&S Committee F (Special Applications) continues to seek promising ideas that would justify preparing requisites for a loose-wheel/broken flange detector suitable for high-speed locations, but to date without avail. A main-line contact-type loose-wheel detector introduced by Raco in the 1960s (now the Safetran LWD-10) can spot a wheel that has moved inward on its axle but may miss one that is hugging the rail as it passes.

- **The elusive crack.** Perhaps the most audacious approach to on-track automatic inspection by any system that has an example in actual service is that of the WHeeLFAX cracked-tread detector (diagram, p. 26). The system installed at the Canadian Pacific's St. Luc (Montreal) yard in 1976 is no longer in service (a government-supported continuation of CP's in-service evaluation, which involved traffic of over 6,000 wheels a day, has not materialized), but Florida East Coast continues its 1977 installation at Bowden Yard (Jacksonville) in service. Unless snagged by something, the flexible boots that contact the passing wheels are reported to last five or six months; inspection is carried out at speeds up to 15 mph. At sensitivity levels used on FEC, 90-to-95% of the wheels the detector identifies by alarm read-out and paint spray are found on inspection to have visible tread defects, 10% of them condemnable in severity.

Scanning Systems Inc. ran out of money waiting for broader acceptance of the on-track WHeeLFAX systems, but its successor, FAX Corp., has sold several dozen hand-scanner WHeeLFAX JR's in the U.S. and throughout the world. Using the same principles to detect, locate, and estimate the size of defects in wheels on or off the train, the JR is in the $7,000 range with readout.

A more fundamental need for ultimately reducing the toll of tread cracks is better understanding of the relationships between residual stresses, detectable cracks, thermal abuse, and catastrophic failure in railroad wheels. Normal-service loading results in plastic surface deformation, so that elastic-range theory cannot resolve the situation, and existing test machines lack the capacity to reproduce all essential mechanical and thermal effects (including vertical rail load) in tests to destruction. Also continuing is the search, still punctuated with the cries of "I have found it" that have been heard at so many times in the past, for a nondestructive method of measuring residual stresses.

- **Mechanizing the car tonk.** Believing that FRA-sponsored work on the automated acoustic detection of wheel plate cracks has shown promise similar to that of hotbox detection by scanner in the early 1950s, investigators in Union Pacific's Research & Mechanical Standards organization have devised an electromechanical in-motion wheel-whacker that is somewhat more sophisticated than the trap drummer's foot-pedal device used to demonstrate the principle. They have rounded up suitable crack-probing and acoustic processing gear and have undertaken reprogramming and expanding of good-bad algorithms from the previous work for use on their minicomputer, with plans to do sufficient work in the laboratory to warrant the installation, somewhere on the railroad, of a prototype field system to try out the technique on cars in general service.

From the standpoint of extent of investment and use, the big end of the wayside detector stick is the infrared hotbox scanner. First used routinely in the late 1950s, and in service at 1,842 installations by the time of the 1972 inventory, scanners and their readouts are still being added and updated throughout the industry. With at least four suppliers, it's a competitive field; there are technical differences among the approaches, some of which may make one or another more suitable for a particular situation, but—as in other mature fields—such matters as commonality, service, and replacement-part availability can also weigh heavily in a railroad's choice.

- **What does it look at?** All currently produced scanners sense the temperature of the passing journal bearing assemblies, though they reflect major differences of opinion as to the most informative (and safest) point or angle from which to look; all represent at least two generations of development, require one scanner unit for each side of a track, are compatible with main-line train speeds, and can generate output signals (temperature rise above ambient) that can be processed on the spot or transmitted by communications circuit to any desired remote location.

Servo Corp., (Hicksville, N.Y.). Servo's fourth-generation Model 8909 "Servoscan" hotbox detector is rail mounted, ruggedized to withstand this position where it looks up almost parallel to the face of the wheel at a 45° angle with the horizontal, scanning the portion of the journal bearing inside the side frame on conventional trucks and just catching the wheel hub on inside-bearing passenger car trucks.

General Electric (Electronics Div., Drive Systems Dept., Salem, Va.). GE's detector now uses a pyroelectric (photovoltaic) sensor, eliminating the high-voltage circuitry of the bolometer (thermistor) sensor used in all other systems. Its single ballast-mounted scanner looks at the side of the journal box near the outer end, generating a signal that is converted to a standard-width pulse of voltage that corresponds to temperature above ambient for motion either toward or away from the sensor.

General Railway Signal (Rochester, N.Y.). GRS's scanner is tie mounted, looks at the hub of each wheel near the axle where the temperature (in an unbraked wheel) is a function of the journal bearing heat input (about ¾ of which flows into the axle). Its reading will also reflect abnormal wheel heat inputs. It has recently been redesigned with more compact electronics, easier-to-service access and component packaging, and a powerful blower to keep rain or snow out of the optics during train passage when its viewing port is open.

Marine Electric Railway Systems Divisions, (Brooklyn, N.Y.). Marine Electric's HB-76-1 is pedestal mounted in the ballast near the tie ends, usually with protective ramps at each side; its bolometer sensor looks at the wheel hub but is gated on and off by each wheel for a duration adjusted for train speed so that only 10 inches of scan, centered on the axle, is recorded and wheel plate or rim radiation does not directly affect the sensor.

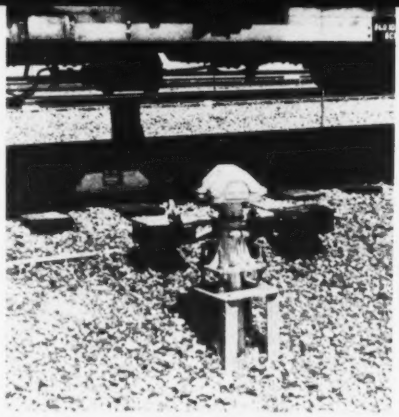
All of these systems use wheel sensors to sequence various functions and protective devices, incorporate heaters and compensation circuitry as needed to keep their optics clear and electronics in calibration throughout extremes of ambient temperatures, and have some internal or external source of an ambient temperature reference.

- **What do you do with the output?** Here, railroad individuality takes over and brand loyalty, if any, seems to disappear as each road combines components from various suppliers. None of the detector manufacturers builds its own chart recorder, so outputs tend to come out in format compatible with commercially available recorders and alarm panels, and therefore with each other. *Primary* use of temperature data will usually be either to generate an automatic alarm if some criterion is exceeded or to record each reading on a strip chart for examination and decision; as a back-up, many alarm systems also put the data on tape somewhere, and chart readouts often provide an audible alarm for any out-of-line readings.

Since roller bearings normally run at a higher temperature than plain bearings, setting a single temperature as cause for stopping a train for examination isn't usually satisfactory, and a great deal of thought and energy has gone into refining the decision process. A skilled and experienced observer looking at the record of a whole train can do an excellent job of interpretation, so many roads, such as ICG, Southern, UP, and D&RGW, have brought all HBD data into one or a few central locations where decisions are made and instructions transmitted by radio to the train crew involved.

Other railroads rely on some established alarm level, usually on the *difference* in temperature between the two bearings on the same axle. To improve discrimination, Marine Electric offers linear compression as an option; different chart deflection rates per degree allow more selectivity among the cooler-running plain-bearing readings while keeping normal and alarm-level roller bearing readings on the scale. Servo has offered an Automatic Bearing Identification option for the past decade—the differences in *shape* of the scan signature between the relatively uniform external temperature of the roller bearing and the triangular pattern seen by the scanner as its view passes from the cool lower edge of the plain-bearing box past its warmer upper regions is used to classify the bearings on each axle by type; an appropriately different alarm temperature is then applied in evaluating each. ABI thus allows setting alarm temperatures closer to the upper limit of the distribution of normal running temperatures without getting false alarms.

Roads that elect to send alarm information directly to the train crew immediately after passing a detector have several options; a current favorite is the axle-count scoreboard that displays the location of the first alarm indication in terms of position from the rear (or, if desired, the front) end of the consist. Various patterns of auxiliary lights are used to indicate side of train, multiple alarms, and type of defect (in multisensor detector arrays). Harmon, Oregon Technical Products, Servo, and others offer standardized units.



Servo Hot-Wheel Scanner installed at Wayside Detection Research Facility. Diagonal line of sight of infrared scanner scans four wheels of passing truck in turn, obtains ambient-temperature reference from stationary target on opposite side of track between wheel intercepts.

Coming up fast are the "talkers," prerecorded tape units such as Servo's "Servotalk," that can specify the location of up to three alarms per detector type per train, identifying the type of alarm for each as it passes the word by radio to both ends of the train in "any local accent or language desired," while observing FCC protocol and expending only 100 watts in the process. Pioneered by Seaboard Coast Line with hundreds of units, the talkers are now going in on Conrail, BN, and other roads in quantity.

● **Looking at wheels, one at a time.** Less immediately hazardous, perhaps, but far more common, are hot wheels from sticking or unreleased hand brakes. Despite the difficulties mentioned above in quantifying the situation, the thermal abuse they represent has to be a major cause of eventual wheel failures. Flat wheels do the track no good, and even the extra fuel represented by a few restrained wheels over a whole division is not trivial these days.

The same infrared scanner technology used in looking for hotboxes can do the wheel job even more easily, since a diagonal, horizontal line of sight can catch all wheels from one side of the track. A natural companion of the hotbox detector, since some of the same read-out and test gear can be used, the HWD is also suggested for stand-alone installation three to five miles outside the departure yard to catch the draggers as soon as they've had time to warm up.

Already manufactured by Marine Electric ("HW-76-1") and Servo ("Servotherm"), the hot-wheel detector is beginning to represent a major segment of the business, with Canadian Pacific scheduling 60 installations in its current program. Whether found in conjunction with hotbox detection or by the specialized HWD, hot wheels are numerically predominant in today's day-by-day spectrum of indications causing trains to be stopped for inspection.

Illinois Central Gulf pioneered in field testing of the hot-wheel detector and is "very gratified" with results from its two Servo units, but has not been in a financial position so far to add more HWD's. ICG reports the following mix of occurrences at its Chicago Hotbox Detection Center. Sixty-four of ICG's 91 wayside detector locations are monitored in Chicago, where an average of 609 tapes a day are examined in "real time" (while trains are passing the detectors) so that in cases where a critical indication shows up, the word may be passed to the train crew even before the rear end has reached the scanning point. In 1979:

Trains stopped for inspection	4,608
"Valid" stops—specific trouble found	3,303
(Includes 140 cases in which trouble was not found initially but confirmed by later events)	
Cars set out for hotbox	940
Sticking brakes (hot wheel)	1,893
Hand brake unreleased	579
Pressure in brake cylinder	272
Retainer valve on	111
Dragging equipment confirmed	138

The hotbox figures - 1979

	Freight car-miles (AAR)	Set-outs (AAR)	Car-miles/ set out	Overheated-journal train accidents-car* (FRA)	Set-outs/ tr. acc.	Damage (FRA)	Damage/ accident
Plain bearings	$6{,}640 \times 10^6$	10,216	650,000	164	62.3	$8,849,000	$53,960
Roller bearings	$26{,}020 \times 10^6$	1,679	15,500,000	61	27.5	4,666,000	$76,500
Total	$32{,}660 \times 10^6$	11,895	2,780,000	225	52.9	13,515,000	$60,070

FRA figures from Accident/Incident Bulletin No. 148 (1979).
AAR figures from Mechanical Division quarterly/semiannual special bearing-performance surveys.

*Locomotive overheated-bearing train accidents (2pl. brg., 3-roller brg.) omitted. Passenger car accidents (not separately reported) included; passenger-car miles are approximately 1% of freight car-miles.

The percentage of indications judged important by the monitors which were confirmed upon inspection in the field (over 70%) is typical of that attainable with experienced people on a continuing basis, and high enough to lend credibility to the system. The number of hand brake and retainer incidents is also enough to keep up interest in the invention of a practical indicator which would bring prompt attention to such goofs.

● **Is there another way?** Like the slide fence that can do nothing to protect a train from the rock that comes bounding down the slope at the very moment of its passing, the most sophisticated wayside detectors can only find those incipient hazards that exist at the time the train goes by; detecting *all* quick-developing faults involves an inherent trade-off between investment and security.

As perhaps the most thoroughly studied component, the journal bearing should at least provide the most comprehensive body of data to consider the situation. AAR member roads contribute quarterly and semiannual reports to the Mechanical Division; these, in conjunction with the reports to the FRA on accidents that result when the hotbox is *not* found in time, give an overall view of progress in the battle against this particular problem. In the decade ending in 1979, the number of such accidents on U.S. railroads decreased 44% (from 409 to 230) while net ton-miles were going up 19%. Hotbox setouts also decreased 32% as the fleet went from approximately 40% to 75% roller-bearing. The table shows the 1979 situation in terms of catching 'em before they burn off.

For the rare roller bearing that does fail, the well-established tendency to progress from normal running temperature to failure in a much shorter time than its plain-bearing counterpart does is probably the main factor accounting for the fact that less than half as many of those that do overheat are found—by detector or otherwise—and set out in time. The fact that more than 96% *are* found indicates that detectors rarely miss one that's in trouble; spacing between inspections simply exceeds the failure time and distance in some cases. Some roads, particularly where increasing hazmat traffic is involved, are adding and respacing HBD's to improve the odds, but at an installed cost per station of $45,000 to as much as twice that if all optional features are included, there is a limit.

An alternative approach, of course, is an on-board detector that can sound the alarm immediately; in the hotbox case, the maximum theoretically-possible rate of heat generation is such that promptly initiated braking should bring any train to a stop before the axle is fatally weakened.

● **Wiring the Amfleet.** Passenger train hot bearing cases are comparatively rare. However, since inboard bearings of its Amfleet cars are not directly scanned by standard HBD's and regular 120-mph operation will resume on the Northeast Corridor in the future, Amtrak has completed in-service evaluation of two systems of on-train monitoring and is starting installations under a 3-to-4-year program that will see all such existing cars so equipped. A nonproprietary adaptation of principles tested on two pairs of coaches equipped with Marine Electric and Safetran systems developed under previous pilot-production contracts, the adopted system monitors only bearing temperature, and thus does not require multiplexing in using an assigned wire in the train line to transmit information to the locomotive cab. Amtrak decided against monitoring air-bag pressure and disk brake temperature on the basis that these conditions do not affect safety.

A thermistor-bridge sensor at the bearing/adapter surface provides a fail-safe temperature indication, maintaining a green light in the cab unless 260°F is exceeded, when a red light and cancellable audible alarm are actuated; any car not generating its own 24-volt "good" signal will block the signal from cars to its rear, indicate its status by a red light in the aisle, and identify within the electrical cabinet which truck's bearings are to be checked. System hardware is being supplied by low-bidder Safetran.

The 150 Budd long-distance single-level cars now on order will include the system; Amtrak's LRC trains have a similar bearing-monitoring system that is not quite so fail-safe since it uses a temperature-actuated switch as sensor.

● **What about freight?** Monitoring any safety aspect of passenger train or transit vehicle status reasonably economically, and without seriously affecting reliability, certainly can use all available high-technology expertise to good advantage, but with electric power and jumper cables for other purposes already available, it involves no particularly novel technical risk. On freight equipment, where the first piece of wiring represents an infinite increase from that currently in use, there are a lot more questions to be answered.

Assuming that trouble detectors that can meet life, temperature-extreme, and ruggedness requirements are available, there is the matter of getting the word to the locomotive—or to the railroad's communication network, which may be almost as good—where action can be taken. Promising results are reported at Queen's University (Kingston, Ont.) in Canadian Pacific-sponsored work on an inductive link in which transformer coupling within the existing air hose gladhands would provide the equivalent of "hard wire" end-to-end communication with no additional attention in the field. Another possibility is a "leaky coax" trackside cable—for this and other purposes—which, as in existing rapid transit communication systems, would connect any point on a train with the world with only a short and relatively predictable through-the-air link to be bridged.

Such continuous, every-car, communication possibilities, in return for their predictably high cost for general implementation, might reopen such other possibilities as instantaneous brake synchronization going far beyond the needs and benefits of hazard monitoring alone.

● **The RF Bolt.** More specific is the Radio Frequency Bolt bearing overheat detector currently in the engineering breadboard stage of development at DOT's Transportation Systems Center, Cambridge, Mass. It is small enough to mount in the elongated head of a standard roller-bearing end-cap screw, and when actuated by excessive temperature the bolt generates a 900-MHz radio signal that transmits an audio-frequency tone to a receiver in the cab. Powered by a long-life battery, an activated unit will continue to transmit for about three hours, which should be ample for locating the alarm

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NEC: A system for fast, dense, mixed traffic

What is the state of the art in wayside detectors as represented by the highest-speed, highest-density territory in the United States, where much trackage is shared by freight and passenger traffic? For the Northeast Corridor Improvement Project, the plan involves purchase of hardware (some of it not likely to be strictly off the shelf) by Amtrak to performance specifications:

Hotbox detectors

—At 35 to 40 mile intervals on main line and at "entrances" to NEC wherever trains have been traveling far enough to warm up bearings.

—Roller/friction bearing discrimination, ambient temperature adjustment, train-average bearing temperature calculation/adjustment.

—Automatic two-level signal:

- "Alarm" level—to signal system to stop train immediaely.
- "Intermediate window" level—to Centralized Traffic/Electrification Control area display for evaluation and action via communication link to train.

—Analog/digital conversion of signal at site to avoid noise problems in transmission.

Dragging equipment detectors

—At all entrances to corridor (stand-alone installations).

—At all hotbox detector locations.

—At locations to protect all interlockings (stand-alones).

—Self-restoring type.

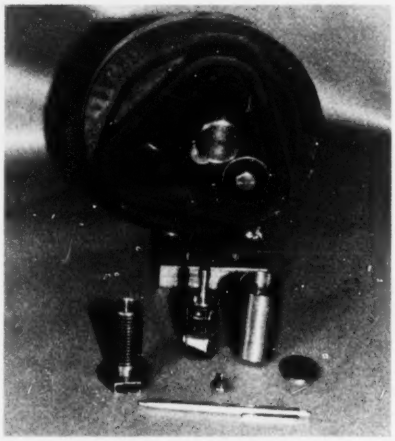
Considered but not adopted because of speed restrictions or discrimination limitations in all known designs: cracked or broken wheel detectors, loose-wheel detectors.

source. Units from TSC contractor Shaker Research, of Ballston Lake, N.Y., were recently tested on the Boston & Maine to verify that the RF pattern they establish should allow reliable reception in a realistic railroad environment at up to one and a half miles. Next step is extensive environmental testing in preparation for exposure to the rough ride of bearings rolling along in service. In common with other individual-car monitoring schemes, such a device can become effective on a percentage-of-fleet basis wherever equipped units may roam, provided that locomotive radios are made receptive to their signal.

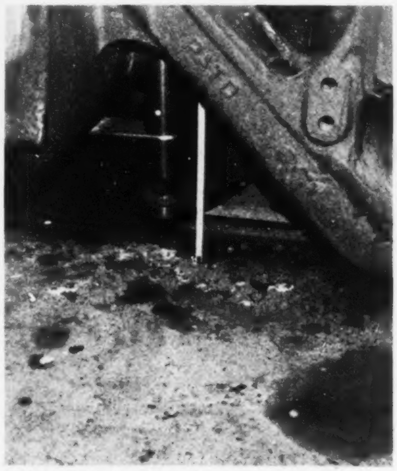
Studies of monitorable equipment and roadway failure modes have also indicated that detecting a single-axle or single-truck derailment may be worthwhile. In a small but perhaps significant proportion of such derailments from any source, the train line may not be broken and the train may continue for many miles, chewing up crossties in the process, until a turnout or other obstruction (in turn, likely to be in a populated area) results in a general derailment that could have been at least greatly reduced in consequences had the first wheel on the ground been immediately detected. Where power and communication are available, such monitoring is straightforward; Bay Area Rapid Transit cars have been so equipped from the beginning. A frangible aluminum-alloy member directly over the rail (initially on both sides, now on one side only to reduce maintenance and false alarms, since its geometry will still insure activation) in the door-open emergency circuit will automatically stop the train. BART has experienced only three derailments in its eight years of operation, all at low speed; elimination of the system on the next order of cars is under consideration.

● **DOT-STAR.** It's easy to forget that there has been an inherently fail-safe train-integrity monitoring system in successful use for somewhat over 100 years now—George Westinghouse's automatic air brake, which not only detects a train separation but does something about it, in the vast majority of cases in time and sequence to prevent intra- or inter-train collisions.

DOT's System for Train Accident Reduction (DOT-STAR), also sponsored by FRA's Office of Rail Safety Research, originated with a 1972 "technology transfer" study by the White Oak (Md.) Laboratory of the Naval Surface Weapons Center (NSWC) looking into nonmilitary applications of components, principles, or expertise developed in connection with Department of Defense programs. The system concept that has evolved works as follows in the case of hotbox detection:


Engineering model of Transportation Systems Center/Shaker Research RF Bolt bearing overheat detector. Replacing one bearing cap screw, the detector sends an alarm to the train radio if actuated by excess heat.

A temperature-sensing element of a unique nickel-titanium alloy that, at a desired temperature, undergoes a phase change in which it shrinks in length by several percent is used to release a heavily spring-loaded firing pin and initiate a percussion primer. The primer initiates a hermetically-sealed "thermal" battery of indefinitely long shelf-life by igniting a pyrotechnic material that melts the solid electrolyte. Detectors on each journal are hard-wired in parallel to one self-contained electroexplosive valve per car. Voltage from an activated detector initiates the valve, venting the train line and stopping the train. A loud whistle from the valve as the train line is recharged locates the car; valve location is such that the existing cut-out cock can be used to isolate the car for set-out or other appropriate action.


DOT-STAR derailment sensor element installed on a DM&IR ore car. Upward railhead impact of more than 7,000 pounds on the foot shears the pin, initiating thermal battery generating signal to explosive-powered cutter that vents brake pipe and stops train.

Obviously, a demonstrably zero false alarm rate is essential to the acceptance of such a system. Twenty-four units on "miniquad" taconite ore cars of the Duluth, Missabe & Iron Range, which has been participating in the program since 1974, have been in captive service since 1975 with no false alarms, accumulating more than 100,000 miles with all components in place but with actuator valves not connected. Nineteen of 19 batteries initiated for test after five years functioned properly.

In parallel with the hotbox detectors are wheel-on-the-ground detectors. The initial NSWC proposal was a mechanical accelerometer on the journal that would detect the impact of a derailing wheel as it fell from railhead to roadbed. It was found that elements sensitive enough to reliably detect wheel impact on an empty could occasionally false-alarm under normal conditions when passing over frogs when the roadbed was frozen; the current approach uses long-travel direct-force sensors of considerable ruggedness, which have withstood two years of DM&IR service with no damage or actuations except on one car, which was found to have been derailed in the loading plant, properly actuating one sensor but wiping its neighbor in the automatic rerailing process.

Units with production thermal batteries are now being installed on the DM&IR for all-up (system connected to brake pipe) service test. A thermal sensor for standard roller-bearing journals (Missabe Road ore cars use plain bearings) which allows either hotbox or wheel-on-the-ground sensor to actuate a common thermal battery has passed laboratory tests and is ready for long-term road-testing in the "passenger" (electrically disconnected) mode.

As one developer of a generally technically successful wheel-flaw detection system observed, "It takes a long time to do *anything* in this business." When you must be ready to detect subtle effects occurring with much less than one-in-a-million frequency while living through the railroad's physical, electromagnetic, and emotional environment, and not spending much money in the process, forward motion certainly can be glacial. Better railroading tools ought to help—such as train-action analytical programs that should make it practical to determine whether a service or emergency brake application is the better choice in an automatic monitoring system over a given spectrum of operating situations. Will increasing equipment costs and liability considerations join with new components and techniques to bring detectors into wider use? Maybe so, maybe not. ■

Market

CARLOADINGS

Loadings of revenue freight in the week ended Oct. 18 totaled 449,571 cars, according to the Association of American Railroads. This was a decrease of 39,826 cars, or 8.1%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Oct. 18 are estimated at 18.3 billion, a decrease of 5.6% below the corresponding week of 1979.

REVENUE FREIGHT CARLOADINGS

Commodity	**Oct. 18 week**	**Oct. 11 week**
Grain	34,274	34,856
Farm products	5,929	5,954
Metallic ores	26,620	25,220
Coal	115,828	115,962
Crushed stone, gravel & sand	15,258	15,399
Nonmetallic minerals	14,771	17,661
Grain mill products	16,666	17,137
Food and kindred products	18,036	17,977
Primary forest products	19,500	20,020
Lumber & wood products (except furniture)	9,194	8,449
Pulp, paper & allied products	19,411	19,247
Chemicals & allied products	27,647	28,687
Petroleum products	5,667	5,802
Stone, clay & glass products	15,476	15,677
Coke	5,173	4,646
Metals & products	13,812	14,705
Motor vehicles & equipment	19,020	18,708
Waste & scrap materials	13,344	12,949
Forwarder & shipping assn. traffic	11,174	11,359
All other carloads	42,526	41,042
LCL traffic	245	230
Total cars loaded	**449,571**	**457,687**
Cumulative total	1980	1979
42 weeks	**18,303,336**	**19,375,051**
Estimated revenue ton-miles (billions), 42 weeks	**738.9**	**734.5**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Oct. 11 totaled 33,289 cars (9.2% below the corresponding 1979 week) and 58,897 trailers or containers (down 9.3% from 1979). Cumulative volume for the first 41 weeks of 1980 is 1,315,097 cars (down 10.7% from 1979) and 2,390,112 trailers or containers (down 8.0% from 1979).

- *Conrail.*—Is leasing track repair and m/w equipment valued at $2.1 million from Evans Track-Work Leasing. The seven-year agreement covers high-speed switch and transversing head tampers, an undercutter and cleaner, a ballast regulator, and a crib/ballast compactor.

- *New York DOT.*—Approved an $18.4-million agreement with Conrail for track improvements to be made between Croton-Harmon and Poughkeepsie over the next two years. The program, to be carried out by Conrail forces, calls for renewal of 26,800 ties, the laying of 84.6 miles of cwr, and installation of cab signals.

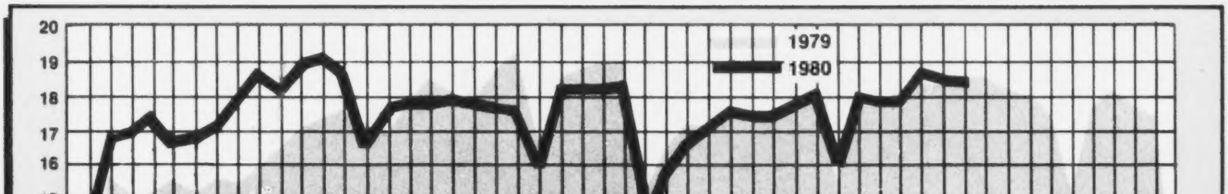
- *Southeastern Michigan Transportation Authority.*—Plans to start preliminary engineering in January 1981 for a Detroit-area light rail system estimated to cost $807.08 million in 1980 dollars (inflated to $1.066 billion over a six-year construction period and $1.143 billion over a seven-year period). Requests for proposals have been sent to technical, engineering, architectural, and management consultants. Following preliminary engineering, a capital grant application will be submitted to the Urban Mass Transportation Administration for final design and construction.

- *Southern.*—Placed orders worth a total of $156 million for 60 diesel-electrics (40 from GE, 20 from EMD) and 2,900 freight cars, for delivery in the first, second, and third quarters of 1981. Greenville Steel Car will supply 800 open-top hoppers, 100 covered gondolas, and 100 wood chip cars; Pullman Standard, 800 covered hoppers; Ortner, 300 limestone hopper cars; and United-American Car Co., 700 pulpwood cars and 100 flatcars.

- *Union Pacific.*—Awarded $24 million of equipment trust certificates to a group headed by Salomon Brothers. Annual net interest cost will be 12.288%. Proceeds will cover about 80% of the cost of 580 100-ton open-top hoppers and 150 100-ton boxcars.

- *U.S. Department of Defense.*—Awarded a $5.5-million contract to Fruit Growers Express for the construction of 47 68-foot, 140-ton-capacity flatcars designed for transporting military equipment. Delivery is scheduled for second quarter of 1981.

- *Vapor Division, Brunswick Corp.*—Received contracts totaling $5.5 million for door-operating systems for rapid transit cars and buses. Contracts are from Budd, Kawasaki, and Crown Coach/Ikarus, and the equipment will be installed in systems in Baltimore, Miami, Philadelphia, Louisville, San Mateo, Calif., and Portland, Ore.



RAIL FREIGHT TRAFFIC TRENDS

BILLION TON MILES (Estimated)

Week ended Oct. 18, 1980
18.3 BILLION

Source: Association of American Railroads

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November 24, 1980

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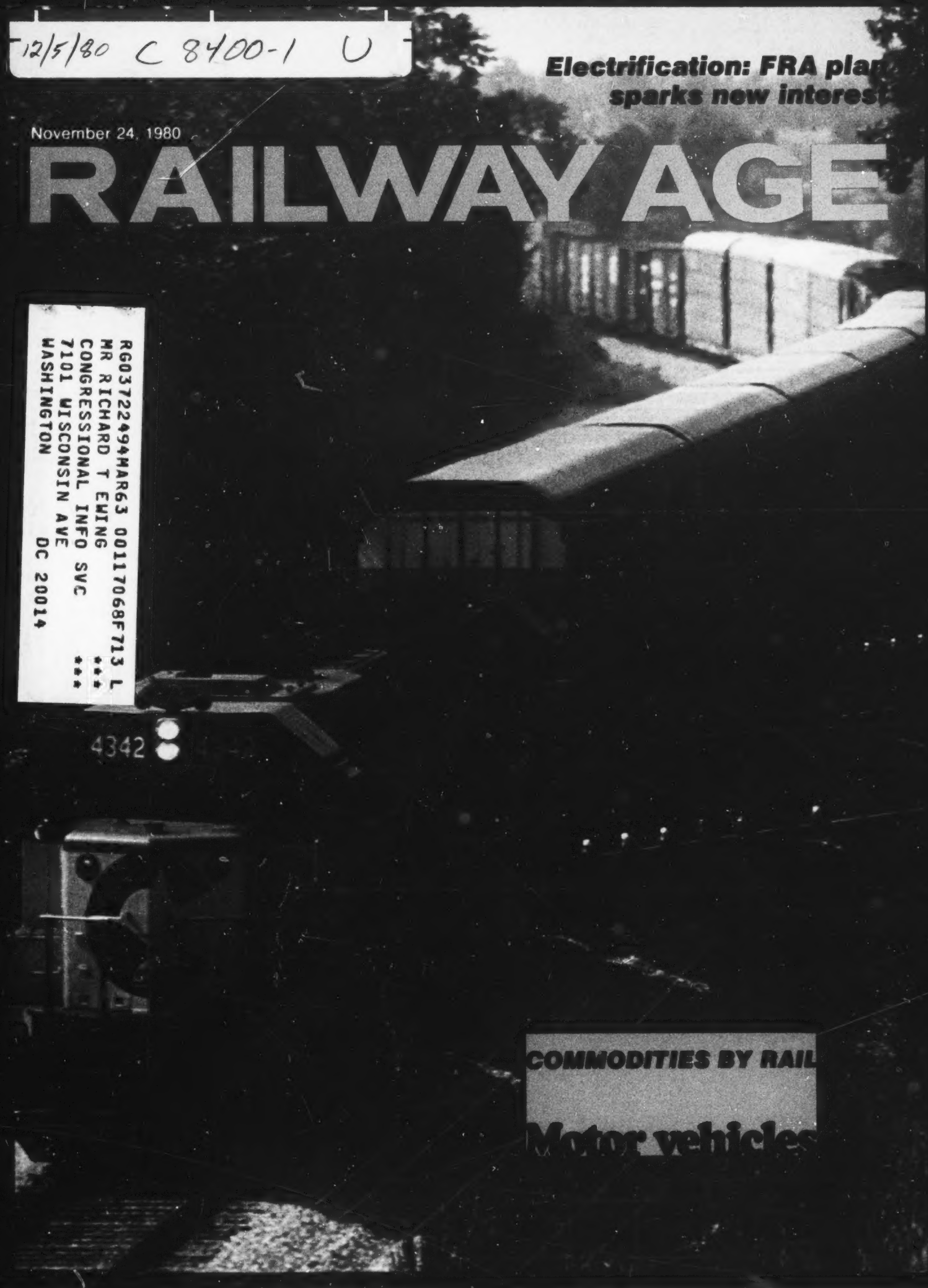

COMMODITIES BY RAIL

Motor vehicles

RAILWAY AGE

USPS 449-130

November 24, 1980 • Vol. 181, No. 22

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Published semi-monthly by the Simmons-Boardman Publishing Corporation, 508 Birch St., Bristol, Conn. 06010.
Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S., possessions, Canada and Mexico: $10 one year, $16 two years; all other countries $25 one year. All other sub-subscribers in the U.S., Canada and Mexico: $20 one year; all other countries, $35 one year. All subscriptions payable in advance. Single copies $1 plus postage and handling except special issues. Copyrighted (c) 1980.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.
Change of address should reach us three weeks in advance of next issue date. Send old address with new, enclosing, if possible, your address label. Post Office will not forward copies unless you provide extra postage.

Member of

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA 18301. Controlled circulation postage paid at East Stroudsburg, PA, and at Bristol, CT.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010

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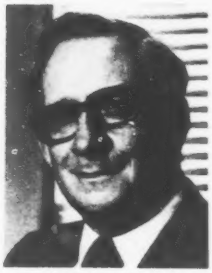
LUTHER S. MILLER

DETROIT'S DILEMMA SOLVED?

"Railroads on the West Coast were watching with interest last week as a new piggyback idea began to take shape. The plan—moving new automobiles piggyback in truckaway-type open trailers—is being tested and studied on the Southern Pacific....From the shipper standpoint the piggybacking of new automobiles promises a way to bring some prime business back to the railroads. In 1957 railroads moved only the equivalent of three weeks' production of autos."

—*Railway Age*, March 9, 1959, p.9

Moving motor vehicles by train proved to be an idea whose time was overdue—and in the decade of the '60s one of the great success stories of railroad marketing and equipment innovation was written. In 1959, the railroads moved fewer than 10% of all new motor vehicles; in 1969 they moved 51.7%. By 1974 they had captured 55.2% of the business.

But in every succeeding year, the trend has been downward; last year railroads handled less than half of the available new-motor-vehicle traffic for the first time since 1968. The fact is, that great success story of the '60s became in the late '70s something of a horror tale.

The rack cars that handle this traffic have become enormously costly, averaging today around $90,000 apiece. Meanwhile, rigid distribution patterns have severely restricted their use. Railroads assign rack cars not just to a manufacturer, but specifically to that manufacturer's assembly plants for hauling a particular model. "To give you an idea of how bad the situation got to be," a Federal Railroad Administration official told us the other day, "a rack car that hauled General Motors automobiles from Atlanta, Ga., to Framingham, Mass., had to be returned empty to the Atlanta plant—despite the fact that there was another General Motors plant in Framingham shipping another General Motors model."

For railroads this has meant an appalling number of empty miles for expensive equipment. For their customers in Detroit, it has meant poorer service.

"The situation offered the opportunity for an enormous improvement in car utilization if all the different parties involved could be brought together," says Peter French, manager of the AAR's freight car utilization program.

How the different parties have now been brought together is described by Associate Editor Frank Malone in the story beginning on p. 16.

EXPORT COAL: THE VIEW FROM VIRGINIA

Travelers flying into Norfolk, Va., these days are being treated to an impressive sea spectacle. Spread out over Chesapeake Bay is a fleet of around 100 vessels riding at anchor. They resemble nothing so much as an invasion armada; actually they are waiting peacefully, though impatiently, for loads of Appalachian coal to take to Western Europe. The Chesapeake Bay traffic jam has received considerable publicity, and the word is abroad that neither the railroads nor their coal piers are equipped to handle the export coal boom. That is not entirely the case, as Norfolk & Western's John P. Fishwick points out in this issue's Railview (p. 42). Fishwick describes the present bubble of demand for export coal, and takes a look at the more substantial bulge that could lie ahead.

RAILWAY AGE

November 24, 1980

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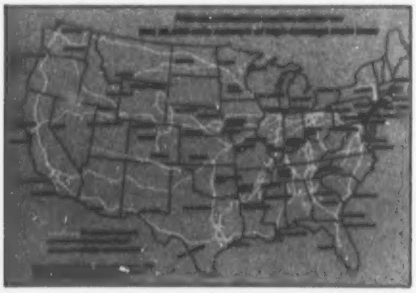
26 Electrification talk is getting serious
Four big railroads have told the Federal Railroad Administration they're interested in exploring a plan under which the costs of electrifying main lines would be shared by the government, by utilities, and by the railroads. A secure source of power is the big attraction.

36 Modular cabinets save shop space
Burlington Northern is moving many spare parts from open shelves to cabinet drawers, opening up new storage space and speeding parts retrieval.

42 Railview: The boom in export coal
Is this year's demand for Appalachian steam coal more than just a bubble? How reliable are forecasts for a long-term surge in coal exports? Can the railroads and port facilities handle it? NW's John P. Fishwick offers some "no," "yes," and "maybe" answers.



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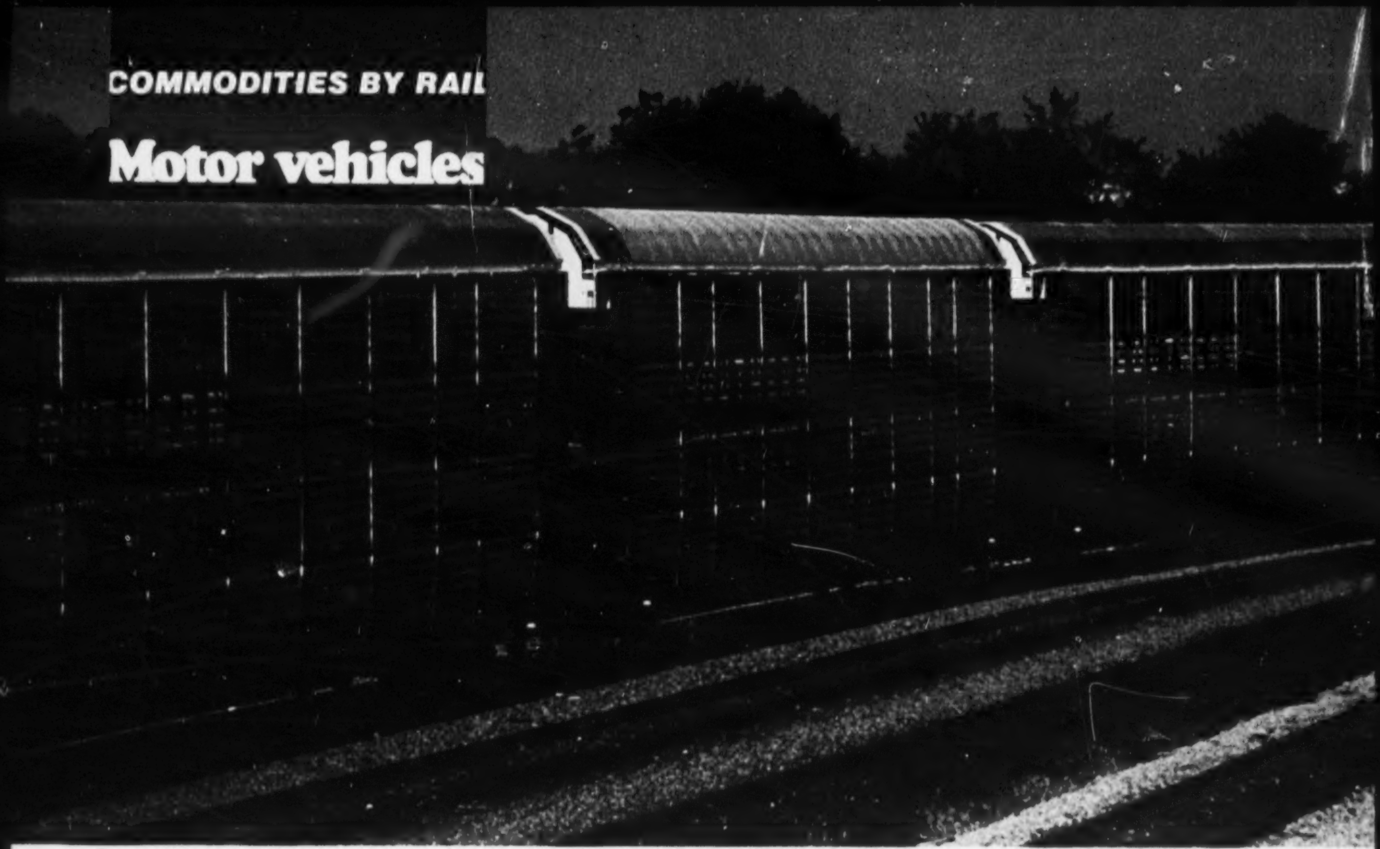
COVER: Photo of multilevel auto racks in a Chessie consist was taken by William M. Kanzeg, Chessie System staff photographer.

Motor vehicles



The goal is to find the cheapest route from an unloading site to a plant where cars assigned to the shipper are needed next.

Detroit tries a bold new approach to

By freeing costly equipment from rigid distribution patterns, the customer gets improved service—and the carrier reduces empty mileage. Two automakers and 20 railroads are now involved in the program, and it's expected to spread.

By FRANK MALONE
Associate Editor

As U.S. automakers retool, their rail carriers are regrouping—the former to regain domestic market share, and the latter to regain automotive market share. Supporting their efforts is a new working arrangement between the two largest automakers and more than a dozen railroads—a tested program that is designed to produce higher levels of service and lowel levels of empty-car miles. Representatives of both sides agree that it is probably the most promising change ever in a long and often troubled relationship.

It's also a relatively radical change. It has been customary for railroads individually to assign cars to assembly plants on their own lines—and to return those cars faithfully to the same plants regardless where they're unloaded. Despite an outrageously high ratio of empty to loaded miles, and perhaps the highest ratio of cars owned per load handled, carriers have clung to that method of insuring car supply in order to protect their business. Under the new arrangement, cars from different railroads are pooled for use anywhere in an automaker's system, regardless of which carrier serves a plant.

Cooperation couldn't come at a better time, as both industries struggle against slides caused by slow response to market demand. For the automakers, of course, it has been the new demand for smaller, more fuel efficient autos; for the railroads, of course, it has been the old demand for better automotive service, especially in terms of car supply.

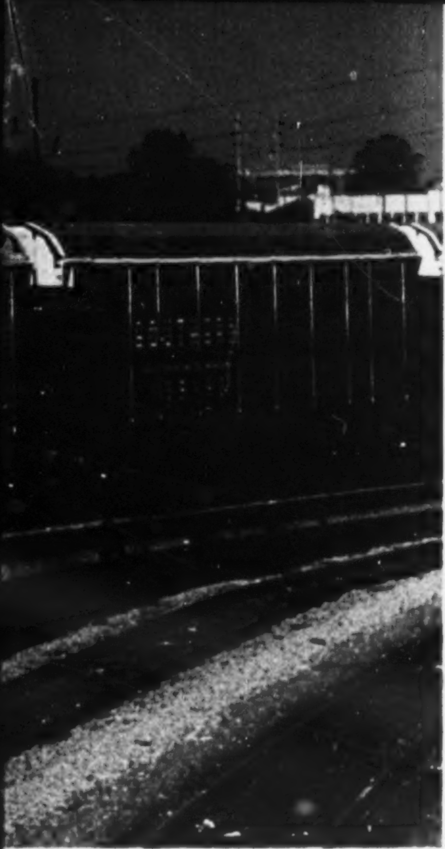
Now, as domestic automakers challenge foreign competitors with all sorts of front-wheel-drive vehicles that go farther and farther on a tank of gas, railroads are challenging truck competitors for that business with one of the best cooperative efforts in their history.

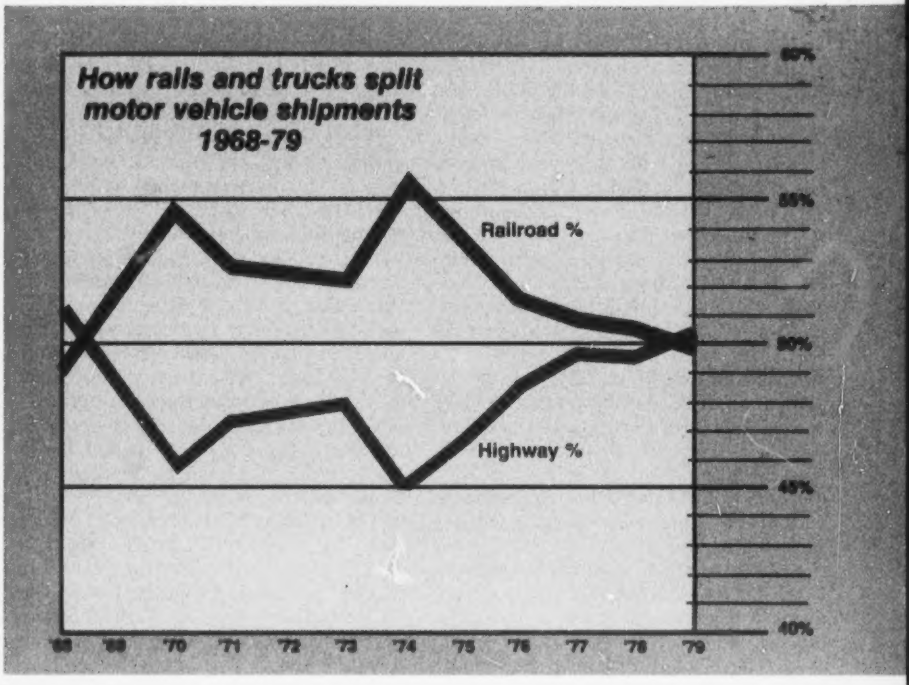
That history includes the recent bittersweet period of the rails' rise and fall as automotive haulers. After watching the truckers steal the show for decades, railroads strove mightily to polish their own act, especially through heavy investment in extremely specialized multilevel equipment. They did well enough that their share of new-vehicle transport reached 55.2% in 1974. It was the best year ever.

However, by early this year the rail share had slipped to 49.9%. Despite good performance by some roads individually, the industry as a whole was unable to consistently—and flexibly—satisfy automakers' demands. Not even a fleet of multilevels that had grown to 36,000 could do the job, because one thing that had not grown was efficiency in moving those cars.

- **High-cost racks, often empty.** For an industry plagued by poor utilization of equipment in general, the problem of the multilevel auto rack made other problems look mild by comparison—especially as the price of a fully enclosed unit (which automakers were demanding, or else) rose to about $90,000.

"Essentially, it was a case of expensive empty cross-hauling of very high-cost cars that were in assigned service to the same shipper," says Peter W. French, manager of the freight car utilization program (FCUP) launched by the Association of American Railroads' Research and Test Department in 1975. "The situation





rack car distribution

offered the opportunity for an enormous improvement in car utilization if all the different parties involved could be brought together."

With federal assistance, FCUP played a leading role in launching the General Motors multilevel reload project about a year ago. This project and a similar one started recently for cars in assigned service to Ford Motor Co. reduce empty mileage through coordination of return movements. This coordination no longer follows the old practice of sending cars empty back to their assigned loading points. Instead, it redistributes cars to locations in order to minimize the cost of empty movements across the entire system.

Two control teams based near GM and Ford headquarters in the Detroit area do the coordinating. Each team has a director and two car distributors who use direct, constant contact with plant managers as a basis for their contact with railroads. For moving cars, the carriers are obliged to follow the control teams' instructions, which are based on computerized monitoring and analysis of car locations and routings. The objective is to find the cheapest route from an unloading site to a plant where cars are needed next.

The GM pool has 6,000 cars; the Ford pool, 2,410. Together, they represent about 23% of the rail industry's multilevel fleet, and there are indications that the percentage is likely to grow. The experimental program's success first led to a broader program for GM, the original participant, then to a new, separate program for Ford—and this has already sparked talk of eventually including Chrysler and American Motors.

(Railroads now handle about 63% of Ford's vehicle traffic, compared with 67% four years ago. For GM, the share is about 41%, compared with more than 50% in the early 1970s.)

- **Results so far.** The reload program experiment included GM's 1980 model year and produced a saving of 6.7 million miles and an empty-to-loaded-miles ratio of .81, compared with the .95 that was afflicting the fleet in general. Eight railroads helped carry out the experiment: Southern, Chessie, Conrail, Frisco, Missouri Pacific, Family Lines, Norfolk & Western, and Florida East Coast. They served nine GM plants and 16 ramps with a pool of 2,200 to 3,300 cars.

The project was barely under way when its effectiveness became evident. Starting the 1980 model year with a minimal forecast, GM's Tarrytown, N.Y., plant suddenly reported a surge of orders. The Troy, Mich.,-based control team was able to respond and supply about 400% more cars than foreseen for the first month alone.

"A plant can shift radically in a very short time," says Richard V. Muehlke, French's assistant. "The only way you can supply the cars that the plant needs is to 'source' from many locations, and the only way to do that effectively is to have authority to do it from ramps on more than one railroad. That's the only way to catch a big upswing at a certain plant and not lose loads. We were able to do that in the very first month of the project and that was one of the first signs that it would be successful."

As of November 1, five more roads were involved in the GM program: Santa Fe, Southern Pacific, Union Pacific, Illinois Central Gulf, and Chicago & North Western. The pool grew by 2,300 cars, to serve 14 plants and 30 ramps. A sevenfold increase in miles saved, to about 46.8 million, is projected for the balance of the 1981 model year (November 1980 through June 1981) with an empty/loaded-mile ratio of .43.

As plans for expanding the GM program shaped up, so did establishment of a similar program for Ford; it started in September and will cover the entire 1981 model year. The Ford program is expected to save 4.37 million empty miles (smaller than GM's saving because of lower loadings and less plant dispersion) and achieve a .84 empty/loaded-mile ratio. Four plants are involved, with a fifth coming in Jan. 1, and about 40 ramps.

Carriers participating directly in the Ford program are Southern, Family Lines, Santa Fe, Conrail, Missouri Pacific, Norfolk & Western, Florida East Coast, Chessie, and Detroit, Toledo & Ironton (being merged into Grand Trunk Western). There are also nine cooperating roads: Southern Pacific, Union Pacific, Western Pacific, Chicago & North Western, Boston & Maine, Delaware & Hudson, Burlington Northern, Missouri-Kansas-Texas, and Denver & Rio Grande Western.

- **Optimism at Ford, GM.** One of the promoters of the Ford program, because of the number of Ford plants on his railroad, was William E. Leavers, NW manager-car distribution and utilization. He's chairman of the Ford program steering committee, which also includes Charles E. Richards, supervisor of the equipment procurement and control section of Ford's transportation and traffic office, along with representatives of participating railroads.

Leavers says only time will tell what the actual savings will be, but he has no doubt that they'll be convincing: "We know for sure that we're going to save empty miles. There isn't any question that we can do a better job on empty return. The railroad industry realizes what this can mean in reducing the need to acquire equipment."

The chairman of the GM program steering committee, Harvey H. Bradley, SR assistant vice president-transportation, says, "We're really extremely optimistic about what can be done with this. The GM and Ford people have been pitching in, and it's been a real cooperative effort all along. If someone else says, 'Look, why don't you do that with us?', we want to go in and talk with them. It gives you a breakthrough cooperative effort from a good many of the carriers."

The GM committee includes, besides member road reps, William B. Kala, GM manager-rail transportation, and Leo Constantine, director of data control and analysis, AAR car service division. There's an assistant chairman, Ronald W. Drucker, Chessie general manager-transportation.

- **Optimism at FRA, AAR.** The list of names of industry and government people involved in the evolution of the reload programs from FCUP is a long one, including one from the Federal Railroad Administration, which provided start-up FCUP funding and still lends important systems support. A former Southern employee, Richard C. Shamberger, is now chief of the operations division of FRA's policy office, and an ardent promoter of the multilevel programs.

Shamberger says the time could hardly be riper: "The automakers understand that they are in trouble, the petroleum industry's in trouble, and the rail industry's in trouble, so we'd all better hang together or we're going to hang separately. The mood toward this is pretty good."

He expects to see the reload concept expanding for other U.S. automakers—and maybe even some importers. For that, however, a larger management mechanism will be needed, one that would likely put control under a new team working under contract for both manufacturers and carriers. That would require a greatly improved computer capability, something being explored by Peter Kerr, an FRA computer expert, who designed the systems approach now in use. Basically an adaptation of a linear program model, at Troy, Mich., it is tied in with GM's computers, and at Dearborn it is being tied in with Ford's.

The makeup of the control teams reflects the commitment by all parties. Director of the GM control team is John Slivka, a former GTW employee, who views the team as a "quasi-disinterested group that gets all the fighting cats and dogs together." Working with Slivka are William C. Bacon from GM and William Dooley from the AAR. The Ford team director is Ted Grabbe from Trailer Train, who got into this activity as part of the GM experimental team under Slivka. Working with Grabbe are Bob Beaudoin from Ford and Dave Jakubiec from the AAR. Both teams work 10 hours a day, six days a week.

Back at AAR offices in Washington, FCUP folks have high hopes for the reload programs that they helped initiate. French says the reload arrangements may well prove one of FCUP's most successful offspring. "A mark of that success is that their direction has been taken over in large part by the participating railroads and the auto manufacturers," he says, emphasizing that FCUP is happy to step back and spend its efforts on applying the lessons learned to other types of special equipment. FCUP still performs certain administrative duties related to control teams' salaries and expenses. These costs are divided among participating railroads.

- **Equipment standardization?** Over at FRA, Dick Shamberger is looking forward to possible long-run reload benefits that French and other rail industry representatives also foresee. These would come from standardization of automotive rail equipment. "The automakers are starting to see that we have to come to grips with the standardization problem, and if ever the time was appropriate, it's now," Shamberger says. French believes that the primary obstacles are not so much technical as corporate. For example, some automakers have specified different components as a way of protecting their car supply. With the reload program, he says, "there's no question that we can go after the universal car, which would achieve another big saving for the industry."

Automakers are likely to agree, if their acceptance of the reload idea is any indication, regardless of how much it may have been influenced by their own market problems. The main obstacle was railroad trepidation. "Some carriers were wary—there was that automakers' reputation for bludgeoning them out of more cars," Shamberger says. Adds Muehlke: "The approach to GM was the last step and one of the easiest. The hard part was getting the original roads to agree on something this radical. It took a long time. It took an ongoing organization to sponsor meetings; help in research, writing position papers, and running numbers; and do the political as well as the analytical work."

The approach to Ford was also easy, especially because that company had a few years earlier tried its own form of national pool. That effort failed for the same reason that a similiar effort of at least one railroad, Southern, didn't go far—lack of effective cross-carrier control. As Muehlke puts it: "Previously, there was a rather vaguely defined negotiating process between plant managers who had cars to spare and those who needed them, with corporate headquarters trying to wrestle with them both and the serving railroad trying to take care of each plant. Headquarters also had to wrestle with railroads trying to keep plant managers happy. The result was that cars didn't move quickly enough to where they were really needed. There was no coordinator with authority to sort things out and route cars efficiently."

- **Rewarding contracts.** GM not only has embraced the reload plan, it has been insuring with contracts specifying a sort of reward for better movement of empty cars. When empty miles exceed loaded miles, GM pays car-mile charges varying according to carrier. Conversely, to stimulate loaded miles, carriers pay varying per-mile charges when loaded miles exceed empty. GM has signed such contracts with SP, MP, UP, ICG, C&NW, FEC, Frisco, and Chessie, and contracts were also being discussed with SR, CR, SF, FL, and NW.

"This is a healthy situation, a cooperative effort that will help us in inventory control and the carriers in meeting equipment requirements," says Earl R. Wiseman, GM director of transportation economics. "We've had two-way loaded movements by truck for some time, but round-trip loaded movement of multilevel rail cars has been only minimally successful, because we didn't have the proper railcar control procedures."

There are some people, however, who think GM's enthusiasm for contracts stems from some of the apparently high per-mile charges to which some carriers agreed, especially the 36 cents for one of the western roads.

Ford, too, likes contracts, but its agreements cover schedule maintenance rather than empty/loaded-mile ratios, and they apply to auto parts cars as well as to multilevels. The goal, however, is the same—better car supply. Ford has service-incentive contracts with WP, SP, MP, and D&RGW and is trying to work out similar agreements with roads in the East. Current contracts are for five years, governing movements of new vehicles and parts from Kansas City to the West Coast. In return for guaranteeing a 95% traffic share, Ford can charge carriers for failure to meet schedules on their parts of the route. Also, carriers pay Ford an allowance for tender of 30 or more cars.

"The big impact on us," says Aden C. Adams, Ford manager-transportation analysis and procurement, "is reduced premium freight costs. With consistent rail service, we don't have to fly or truck material to plants because of car delays. Railroads have lost some of our business, but now these contracts should increase their share again."

Waiting in the wings for some form of improved relationship with carriers, Chrysler moves about 60% of its vehicles by rail, slightly more than in 1975. That's due, however, to a reduction in the number of plants producing the same product, says D. B. Whitmer, director-traffic and customs. He's ready for contracts, reload programs, or whatever will help improve transit time: "There are still many opportunities for further improvement. Some progress has been made in certain areas, but on average, transit times have not shown any improvement in the past several years. They're averaging approximately one day longer than in 1977.

"We have had discussions with several railroads about the feasibility of contracts, for both built-up vehicles and auto parts. We believe contracts should cover equipment, rates, and service commitments. Deregulation is going to cause us to examine many aspects of how we conduct our business and work with rail carriers to our mutual benefit. We'll be looking for opportunities to eliminate costs and improve efficiency. That includes simplified communications and data transfer, as well as better service and car supply."

● **A threat sidetracked.** Also viewing contracts hopefully is Richard Haupt, director of Ford's transportation and traffic office, and perhaps the automaker representative best qualified for some final words on relationships with railroads. Many rail officers still remember Haupt's speech at a Greenbrier meeting in June of 1978. "It appears that the best we can hope for is that approximately three out of

L&D: AAR's prevention program goes right to the loading ramps

Two years ago, the title of a *Railway Age* article on motor vehicles loss and damage called the claim-payout numbers "numbing." They still are, having reached a new high of $92.4 million for 1979. In the past two years, however, a program to reduce that cost has quietly but firmly taken root at rail-side autoloading areas across the U.S. and Canada.

"I am encouraged by recent efforts by the AAR damage prevention committee, which, if continued and expanded, can be extremely beneficial in focusing on causes of loss and damage and on solutions," says Don Whitmer, Chrysler's director-traffic and customs.

Whitmer is talking about the ramp-audit program of the Association of American Railroads' Damage Prevention Section, and about something that definitely will be continued and expanded. One reason it will is the enthusiasm of shippers, even though the program has shown that much L&D occurs before trains leave their plants.

● **Investigating the ramps.** In a herculean effort, a small AAR staff of investigating experts, with the full cooperation of automakers and railroads, in late September completed a 22-month cross-country probe of 61 automotive loading facilities. They logged about 52,000 miles and many thousands of hours in audits that often continued through three plant shifts.

Seeking loading-site causes of loss and damage, regardless of how minor, the investigators developed and displayed an expertise that won the respect of the manufacturers. "Shipper reception has been tremendous, because our people have gone in with experience that couldn't be found anywhere else," says Ralph A. Grover, AAR director of damage prevention.

But what, it might be asked, does that have to do with a $92-million problem? AAR teams don't just audit, they report their findings promptly and thoroughly, and that should eventually lead to lower claims. As Grover explains: "The problem stems from a hundred little things that aren't done right. We look at everything that causes damage, and we try to get shippers to make improvements. It's as much to their advantage as to ours."

The audit program is based on an important AAR document, the multilevel manual now being revised for reissue in early 1981. It meticulously describes loading, train-handling, and unloading of motor vehicles. "Our manual is just like a railroad safety publication," Grover says. "Safety publications are written in blood, because everything is in there because somebody got hurt. Everything is in our manual because some vehicle got damaged."

Involved in the field audits are Robert L. White, Jr., manager-commodity studies, as program director, and staffers Jim Britton, Charles Eggensammer, Ralph Groskopf, and Ken Weibel.

The program has expanded to include destination ramps as well. As of Nov. 1, White's teams had made 10 destination audits, of ramps chosen in direct relation to origin ramps. "We look at multilevels coming in from loading sites audited before," White says. The reason, of course, is to see if shippers have been heeding their reading of AAR origin-ramp surveys.

The audits cover every aspect of loading/unloading, including preloading inplant practices, ramp-driver habits, and haulaway procedures. Multilevel components comprise a major element. "We've looked at more than 22,000 tie-down devices," White says.

● **Getting cooperation.** AAR staffers follow up their audits with calls to the low-rankers, but always with support from company officers. "The cooperative attitude is much better than it's ever been," says Grover. "We're getting to the people who can make decisions, and we're showing them conclusively where people in their own organization need to do a better job. With this level of understanding, we get shippers and carriers involved so that the finger-pointing stops and some constructive sharing of responsibility starts."

Another effort to reduce damage is the national task force program. This covers the entire distribution cycle with a scrutiny as scrupulous as that for origin and destination audits.

Blessed by the AAR damage prevention committee, the Grover/White program includes many good features from carrier projects. "The railroads have been out there saying the same things," Grover says. "We're not telling the auto manufacturers anything very new, but they'll listen to a sort of third party."

Another major element in automotive traffic L&D prevention is training. Within the past six months, the AAR's prevention staffers have released a new batch of formal vehicle-handling training programs for carriers and shippers. The programs stem in part from AAR-conducted workshops.

Along with audits, training programs will become a crucial weapon in a war that statistics show the railroads have been losing.

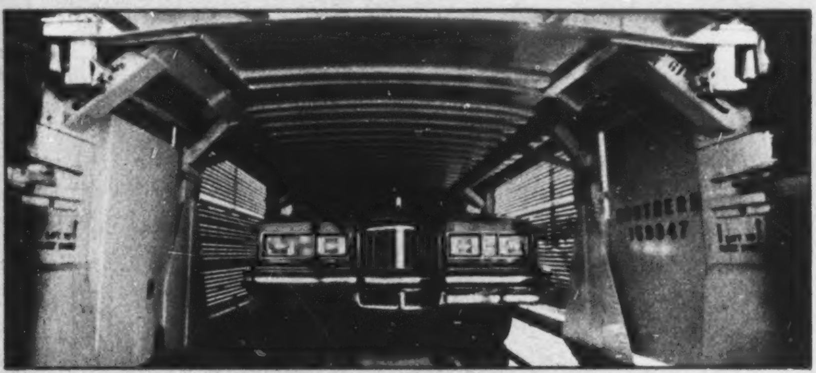
every ten of our multilevel cars will reach destination on the schedule that *you* have said *you* can perform, and that's pretty bad," Haupt said, among other things.

One thing was a threat: "I want you to fully understand that we are willing to spend more money to move our product by other than rail transportation if this is necessary. Senior management has been made aware of the decline in carrier performance, and by no less than a mandate from our bosses we have been told to rely less upon rail transportation unless we can commit to improved rail performance."

He also pleaded for better interroad handling of multilevels and auto parts cars.

When the Greenbrier talk was made, Ford had nearly despaired of bringing railroads together, says Haupt. For its part, Ford launched a transit action program of meetings with groups of carrier reps to discuss worst-performance routes. Also for its part, the company supported and joined the reload program, and worked out service contracts.

Currently at least, Haupt sees no need for another alarm-sounding speech. He says: "I guess that right now I'm reasonably optimistic." ■



Interior of a Portec trilevel rack, showing the rackmaker's tracks and tie-down system. Standardized tie-downs are important for development of car pools for faster reloading.

Multilevel racks need refinements to cope with the new breed of autos

The fully enclosed, multilevel auto rack car represents one of the longest—and most expensive—evolutions of special rail equipment. There's now a user-carrier consensus that evolution of the basic unit has peaked, and the current stage is one of refinement of some crucial components. That refinement, however, may be more difficult than expected, as automakers' products undergo a new evolution to the "international" smaller, lighter, more efficient vehicle.

Equipment suppliers, of course, are concerned, and one of them is Portec, whose Railcar division has taken a total-car systems approach to research and development. The division's vice president-sales is Charles M. Burt, who sees refinement needed in end-doors and tie-down systems, as do other manufacturers. But he also sees particular pressure for refinements related to a new breed of automobiles.

After developing equipment designed to move and protect the "typical American car," suppliers now have to shift a gear or two. Says Burt: "We now have to look again at the automobile evolution from the large, heavy vehicle to what we are getting to know as the international car, a light, small vehicle. You get more vehicles on the auto rack car, consequently a higher risk of damage, especially as the lighter auto responds differently to impacts. Now we have to take a whole new look at what happens to the auto in transit."

• **Giving cars a better ride.** One thing Portec Railcar researchers are looking at is better cushioning material for the insides of steel racks. Other things are components such as snubbers and spring groups to improve ride quality.

Among the most important elements are tie-down components. The tie-down track is standardized, but there are costly differences in the chains and hooks that secure the vehicles to the tracks. A basic difference is that between the "T" and the "R" hooks, the most common hooks that fit into holes or slots on the undersides of vehicles. There are also "U" and "S" hooks.

All are featured in the manual of standards and practices of the mechanical division of AAR's operations and maintenance department. They're there mainly because of shipper preference, although there is growing agreement on the need for standardization. Along with different hooks, however, there are various chain lengths and varying vehicle locations of holes or slots for the hooks.

"Standardization of that tie-down system is important for development of a national pool, as is being discussed for faster reloading," Burt says. "When you start talking about reloading, you're talking about ability to load a product in general, not an individual manufacturer's."

Tie-down problems are surfacing especially for lighter autos at the ends of auto rack decks, where they are subjected to greater chain strain than the autos in between—a strain that can cause auto bodies to buckle.

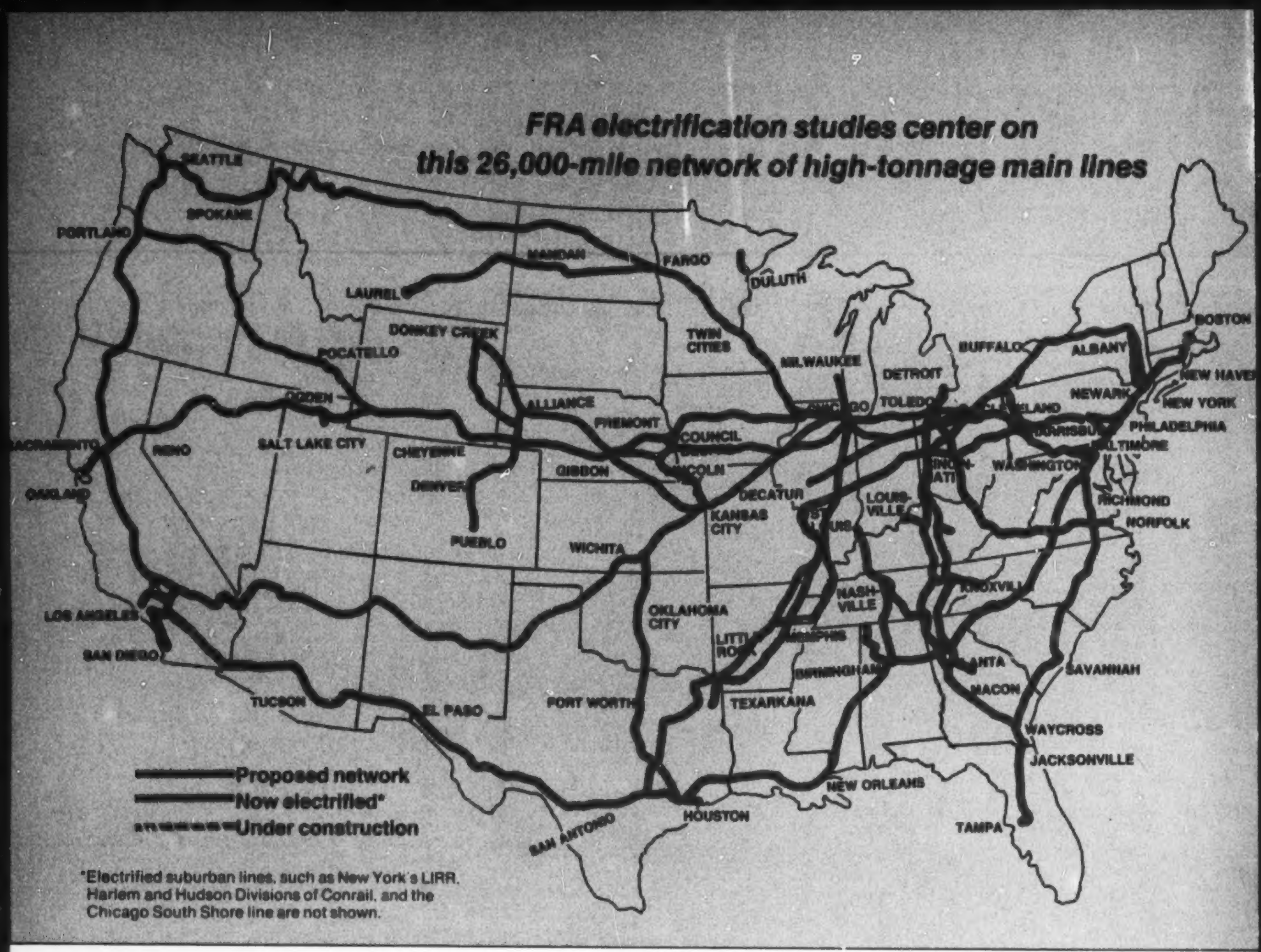
Another deck-end problem is height clearance. "As you go to the smaller cars, you're also going to taller cars, because there's less room for a person to spread out. You have to sit erect in them. If there are hinge decks at the ends of auto racks, the taller vehicle has clearance problems," Burt says, adding that Portec's answer is a fixed deck from one end to the other.

• **"Mechanical nightmares."** Perhaps the biggest problem, however, is the end door, regardless of auto size. The doors rounded out the fully enclosed auto rack, in an effort to block access to vandals and flying debris. But doors have become "mechanical nightmares," in the words of an AAR loss and damage specialist, and Burt agrees. He says mechanical simplification of end doors is a major goal of his company's R&D efforts. Other suppliers—among them Youngstown Steel Door, Paragon, Whiting, and Whitehead & Kales—are working on the same problem.

"You ask a railroad man, and he'll tell you the end of a car is the worst possible place to put a door," Burt says. There's already an overhang of 11 to 13 feet for rack cars with 56-foot truck centers, and adding an end door just makes things worse.

Whatever the component, it all boils down to suppliers' renewed concern about a well-developed piece of equipment, a concern stimulated by automakers' retooling for a market that has changed radically in a short time.

If that weren't enough, there's yet another wrinkle. After prodding suppliers toward development of the fully enclosed auto rack, one major automaker now is calling for one that's not so fully enclosed. In an understandable effort to hold down rail rates during trying times, Ford wants to use less-costly, side-shielded cars.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Proposed network
Now electrified*
Under construction

FRA electrification studies center on this 26,000-mile network of high-tonnage main lines

*Electrified suburban lines, such as New York's LIRR, Harlem and Hudson Divisions of Conrail, and the Chicago South Shore line are not shown.

Electrification talk is getting more serious

Interested railroads are ready to work with the FRA to study how a nationwide network of electrified rail lines could be shaped, financed, and operated. Primary goal: achieving fuel security.

Some major U.S. railroads are serious about electrification—at least about discussing its major aspects with the federal government. Surfacing recently at a conference sponsored by the Federal Railroad Administration, the railroad seriousness will remain a matter of public record worthy of attention from FRA under the Reagan presidency.

Also worthy of attention will be arguments in favor of electrification, especially in view of another matter the new Administration must consider, namely the national need for greater energy independence.

Southern, Conrail, Union Pacific, and Burlington Northern have all at one time or another undertaken their own studies of electrification. At an Oct. 22 meeting in Kansas City, high-ranking representatives of those roads told Federal Railroad Administrator Jack Sullivan that they were willing to take part in joint studies of specific crucial aspects such as financing, which no carrier could handle on its own. Spokesman for the carriers told *Railway Age* on Nov. 5 that the commitments remained intact.

● **Aspect: Green.** In Kansas City, Sullivan phrased the conference's major question as follows: "Assuming that we could overcome the capital barrier, would you undertake a serious discussion of an electrification program?" He got unqualified yesses from John C. Kenefick, UP president; Thomas J. Lamphier, BN transportation division president; John L. Sweeney, Conrail senior vice president; and Walter W. Simpson, Southern vice president-engineering. Some other railroads represented at the meeting have since expressed interest in working with the FRA.

As a result, FRA staffers are organizing four working groups to study: (1) the shape of an electrified system; (2) its financing; (3) technical and operating elements; and (4) interinstitutional elements such as environmental impact. In charge of assembling these study panels is Lou Thompson, who has been directing improvement of the Northeast Corridor for FRA.

"Electrification is an idea whose time, everybody realizes, is coming as much as it ever will," Thompson says. "It's time to get on it and figure out whether there is a way to do it. The FRA has gone about as far as it can go with this, and now it's time for us to be dealing directly with the rail-

Net investments and savings due to electrification

Category	
Route miles	26,000
Traffic (MGTM/Y)	945,800
Investments (million $):	
Catenary	6,040
Substations	2,620
Signal and communications	4,400
Civil reconstruction	1,660
Electric locomotives	5,240
Total investments	19,960
Credits (diesel locomotives)	−5,060
Total capital requirement	14,900
Annual costs and credits (million $):	
Diesel locomotive replacement	−281
Diesel energy	−1,500
Electric energy	1,110
Diesel locomotive maintenance	−1,360
Electric locomotive maintenance	409
Catenary maintenance	114
Net annual savings	1,510
Economics:	
Cumulative savings (29 years)	43,790
ROI	14%

roads. Otherwise, we're not going to get good answers to our questions."

Rail industry involvement will be crucial not only for analyzing but also for promoting electrification among energy alternatives. As Sullivan says: "Part of our getting together is to prepare our case for a known technology and known benefits. We have to get input from the railroads to reaily make a solid case."

FRA studies have centered on a 26,000-mile system of main lines handling 30 million gross tons or more a year. The system represents nearly 14% of all route miles but handles more than 50% of all rail tonnage, based on 1978 figures. Electrifying those 26,000 miles would mean that railroads' yearly oil consumption would drop by 56 million barrels, according to FRA. That's about half of current annual consumption.

- **The goal: Power security.** "In the event of a petroleum shutoff, the rail system would be largely insulated," Sullivan says. That security seems to rank higher in proponents' minds than the savings in overall national petroleum use, because the rail industry already accounts for less than 2% of national consumption. Electrification could reduce that share to about 0.6%.

As BN's Lamphier says: "We have been very serious about electrification because we're more concerned about availability of diesel fuel than we have been about its price. The independence idea is very attractive to us."

An insulated rail system, however, would be free to handle increased traffic from fuel-short trucks as well as to continue handling its own loadings. "Apparently, during World War II, the Pennsylvania Railroad increased the flow of traffic over its electrified network by about 40%," Thompson says. "If the electrified network that we're talking about did that, the fuel savings would more than double because of the shift of traffic from trucks. So you can't look only at the rail mode's low percentage of fuel consumption. You have to look also at the truck mode's high percentage as reduced by greater reliance on a secure rail system."

FRA studies project a 14% return on investment for the 26,000-mile network over a 29-year period. Net annual savings would total $1.5 billion, for cumulative savings of $43.7 billion on total capital investment of $14.9 billion.

At the Kansas City meeting, Sullivan and Thompson cautioned that the shape of an electric network still needs a lot of study. Refining the configuration would be the duty of the planning panel, whose members would first have to define the criteria for deciding which lines would be electrified. Thompson says the FRA system proposal would be refined so that a working draft would be available for the panel's pondering. The panel then would try to produce a "quantitatively justifiable" system, one that could survive attempts to change it for purely political reasons.

- **Financing the system.** The key panel, however, will be the one dedicated to producing a financial mechanism for a project that at first glance seems staggering in cost. The largest single element would be the catenary system, estimated to cost more than $6 billion. The government would have to share the burden, but in such a way as to guarantee a recovery of its funds. One way would be a sort of variable user charge, based on kilowatt hours used, for payback to a federal revolving fund.

"We have to find a mechanism that permits payback on a basis that does not appear immediately on a railroad balance sheet," Thompson says. "Each segment could be financed by a revolving fund. Knowing the capital cost when completed and projected traffic levels, you would calculate the electrical energy needed, divide that into the traffic, and reach a prorated payment to be made for each kilowatt hour. Cost/traffic calculations would lead to the amount to be added to the monthly electric bill as payback to the revolving fund.

"The important thing is that this would take the payments off the railroads' balance sheets and convert them from fixed charges to user charges variable with the traffic. That's exactly the situation now enjoyed by the trucks and barges."

Thompson emphasizes that such a mechanism needs a lot more study, for administrative as well as functional reasons, but he sees it as probably the only workable plan. He also sees it as a way to deal with each railroad as a contractor, as the Federal Highway Administration deals with states on the Interstate system. That way, the government role remains more palatable than, for example, its role in Northeast Corridor renovation.

As for the term of payback, railroads could choose between 10 and 20 years. "According to estimates that we have, a ten-year payback schedule would result in nearly all the saving from electrification going for payback," Thompson says. "A 20-year schedule would have about half the savings going to the revolving fund and the other half accruing immediately to the rail industry."

- **Operating the system.** As for the technology/operations panel, a major concern would be the signal and communications systems for an electrified network, differing from those for diesel operations. Addressing this major-cost element, the panel would also address a major-savings element, the reduced cost of maintenance for electric locomotives. At the Kansas City meeting there was wide agreement that maintenance savings would be significant, though there are differing estimates of just how significant. This panel, Thompson says, would attempt to answer all the questions for people who've never run an electric railroad.

One thing they won't have to answer are questions about electrification's fundamental technology. "There's nothing particularly exotic, or difficult, or even unfamiliar about it," Thompson says. "That doesn't mean it can't be made better, but there is just no argument remaining that electrification won't work or that it depends on major new technological advances for success.

"Many other countries are way ahead of any scale of electrification that we would ever be likely to discuss for the U.S. One good example is the Soviet Union, which runs an electrified railroad that basically runs the rest of the country. They are increasing the size of that system by about 600 miles a year. They regard the technology as proven enough for them to structure their economy around it." Supporting that viewpoint at the Kansas City meeting was a technical panel consisting of AAR, FRA, and rail industry representatives.

- **Economics of the system.** The fourth study group would address interindustry or interinstitutional problems, especially those of the utilities. One question would be the utility industry's ability to handle

FRA estimates that reduced locomotive maintenance could account for 62% of savings achieved by electrification.

increased demand from an electric rail system. In Kansas City, rail officers told Sullivan that utilities in their territories foresee no great supply problems. Agreeing was Blair Ross, an official of American Electric Power Co. and a long-time advocate of rail electrification.

Utilities, however, would face capital outlays for new units, transmission and distribution facilities, and traction substations. There would be state regulatory problems, too, along with environmental concerns.

But perhaps the biggest task of this panel will be to determine and defend the economics of railroad electrification, in the face of other alternatives for national energy security. One man who has been working on this issue for several years is Robert K. Whitford, a member of Purdue University's automotive traffic center. In August, Whitford completed a study for the U.S. Transportation Department that said rail electrification, using existing technology, is cost competitive with synthetic fuel plants now and "should be considered by the United States as a potential national investment of equal priority."

Such things as construction of synthetic fuel plants, gasohol production, and improvement in automobile fuel economy are limited in investment level by technology and other constraints, Whitford says. "In addition, the full output of synthetic fuel plants will be needed to supply automotive needs for a very long time to come. Railroad electrification provides another reasonable, economically compatible, fuel-conservation alternative without new technology constraints."

That, essentially, was Whitford's message at the Kansas City meeting, too, where he outlined the investments and savings of electrification along with those of alternatives such as shale oil, coal liquefication, biomass (grain), and automobile efficiency. He also compared the technology risks for each alternative, as well as energy efficiency and social/environmental impact.

● **FRA's findings.** FRA's own studies stem from the well-known preliminary report, "A Prospectus for Change in the Freight Railroad Industry," published in October 1978 in response to requirements of the 4R Act. An appendix of that report addressed the costs, benefits, and energy/environmental impacts of electrification as directed by section 901 of the Act. Findings were that certain route segments were likely to benefit significantly, although national benefits, especially in lower petroleum consumption, would not be large enough to warrant government sponsorship of a major program of rail electrification. FRA, however, proposed to support further research, and one result was an update of the appendix evaluation of costs and benefits published in 1978 and based on 1976-77 realities.

Released in April, the update shows that estimates of net operating savings from electrification have more than doubled since the appendix evaluation was made (investment estimates have "approximately" doubled). "Railroad electrification is a mature, demonstrated technology, and is the only mode for intercity transport of goods and people that can be shifted from liquid petroleum-based fuel without the need for additional technology development," the update said, before concluding that goverment support of a demonstration project is warranted. "While the demonstration project may also provide stimulus to other railroads to electrify, it is prudent that a more defined policy be developed by the FRA to provide incentives to electrification which are consistent with the expected social benefits," the update concluded.

The update also cites a major study completed last year by Gibbs & Hill, showing that electrification of Conrail sectors east and west of Harrisburg is technically and economically feasible. Discussing that study at the Kansas City meeting, Garry Collins, CR director of corporate planning, said the railroad has no doubts whatever about the economic benefits of the shift. One of the greatest benefits, he said, would come in reduced locomotive maintenance. Another would be in fuel-cost savings, which Collins said had likely been underestimated.

● **Other studies.** Another major study is under way, that of partial BN electrification, by Arthur D. Little. BN's Lamphier says the study already has shown that return on investment might be even higher than estimates by FRA for electrification in general.

Of a study in the early 1970s by UP, Kenefick says: "It looked quite interesting, but the price tag was $500 million, so we put the project aside. If the price tag had been lower, we certainly would have made a more detailed study and we probably would already be putting up the wires."

Southern, too, was an early studier, especially of its main line between Atlanta and Cincinnati. "We have never really stopped studying it," Harold H. Hall, SR president and chief executive officer, says. At Kansas City, Simpson said Southern basically agrees with FRA on the benefits in general, but would like to see better analysis of locomotive maintenance savings in particular.

● **The cost problems.** While agreeing on the potential for savings, the railroaders also agree that the potential costs are cause for some sober thinking, indeed. A good summary of those costs comes from Purdue's Whitford: "The major cost of electrification occurs in two categories: namely, in the fixed plant required to achieve electrification and in electric locomotives. The largest of the fixed plant costs per route mile is the catenary. Other costs involve the upgrading of the utility (both its generation and transmission capacities) to meet the added power requirements, substations to mate the power from the utility to the catenary, burying the communication and signal cables to reduce the effects of noise and interference, and the civil reconstruction necessary to ensure adequate clearance for the catenary.

"A conservative estimate of the fixed plant cost, according to recent, actual engineering data, appears to average about $500,000 for each route mile of single track and $800,000 per route mile of double track. In the second area of investment, the cost of electric locomotives, on a per-horsepower basis, appears to be equal to or slightly below the diesel equivalent." He cites price tags of $900,000 for a 3,000-hp diesel locomotive with an 18-year life and $1.2 million to $1.5 million for a 5,100-hp electric locomotive with a 30-year life. He also cites electric locomotive capability of traveling 187,500 miles a year, compared with 125,000 miles for diesels, and a 25% higher general availability rate for electrics.

Such statistics are part of the reason for FRA's estimate that reduced locomotive maintenance could account for as much as 62% of the savings to be achieved by electrification, compared with about 26% from reduced energy costs. Churning out such estimates have been, among others, Curt H. Spenny and Frank L. Raposa of the Transportation Department's transportation systems center. They have the analytical tools that will be available to members of the industry-government working groups that Thompson is organizing.

But the railroaders have the experience needed for further analytical pursuits. "From here on out, if the idea's going to be developed it's got to be a joint effort," Thompson says. "It's got to have a lot of industry participation or it will never have the kind of credibility that it will need in order to move forward."

Thompson sees the panels as oriented toward "essential homework" on aspects of an idea whose merits, he says, are "essentially nonpolitical." ■

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Railway Age descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876 is indexed by the Business Periodicals Index and the Engineering Index Service Name registered in U S Patent Office and Trade Mark Office in Canada

Published semi-monthly by the Simmons-Boardman Publishing Corporation 508 Birch St Bristol Conn 06010 Subscription rates to all railroad rail rapid transit employees and industrial traffic department employees in the U S possessions Canada and Mexico $10 one year $16 two years all other countries $25 one year All other sub-subscribers in the U S Canada and Mexico $20 one year all other countries $35 one year All subscriptions payable in advance Single copies $1 plus postage and handling except special issues Copyrighted © 1980

Address all subscriptions change of address and correspondence concerning them to Subscription Dept Railway Age P O Box 530 Bristol Conn 06010
Change of address should reach us three weeks in advance of next issue date Send old address with new enclosing if possible your address label Post Office will not forward copies unless you provide extra postage

Member of

Printed at Hughes Printing Co 34 North Crystal St East Stroudsburg PA 18301 Controlled circulation postage paid at East Stroudsburg PA and at Bristol CT
POSTMASTER—SEND FORM 3579 TO P O BOX 530 BRISTOL CONN 06010

Inside

LUTHER S MILLER

NO MORE FRONTIERS?

One hundred years ago, the city of Boston was celebrating its 250th birthday, and in honor of the occasion the Ancient and Honorable Artillery Company of Massachusetts sealed and entombed a "Century Box," which was to be opened 100 years later. The box contained, according to records of the day, 27 documents relating to the life and times of the city and the commonwealth. One of these documents was prepared by Captain Albert A. Folsom, who had been asked to write on "Travel and Transportation by Rail."

The box was opened a few weeks ago—and Captain Folsom's document proved to be the surprise of the lot. Instead of writing about railroading in 1880, he had written his prediction of what railroading and transportation in general would be like in 1980. His prediction about railroading was brief. "Travel and transportation by rail has almost reached perfection in 1880," wrote Captain Folsom. Having reached this state of perfection, he went on to say, with no more technological frontiers to conquer, railroading would rather quickly die—due to the increasingly high cost of coal for the locomotive furnaces and the scarcity of water for the boilers. (It did not occur to him that any form of locomotion could ever replace the steam engine.)

So the railroads would wither away, he said, and by 1980 would be replaced by airships that would "be seen dotting the sky like stars."

"The velocity of these vessels will be truly wonderful," predicted the captain. "I anticipate 250 miles per hour....The aerial ship of 1980 will be propelled by a combination of motive power. Said combination will consist of electricity, compressed air and another power now unknown, and not even dreamed of....The carrying capacity of these ships will be immense. The largest will comfortably transport 10,000 people and freight besides. The length will be 1,000 to 2,000 feet....This wonderful achievement of power will exert a most beneficial effect upon mankind. It will render war between nations impossible....No nation will dare to attack another from the fact that war will at once be fearful in loss of life and most expensive in money and material."

Predicting transportation trends has always been a risky business.

"GRAB THOSE OPPORTUNITIES"

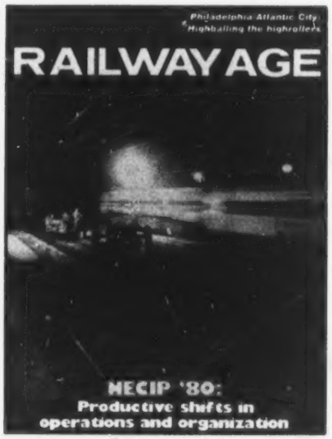
In our own 1980 series on railroad technology, we have been a little more cautious and timid than Captain Folsom. We tend to agree with L. Stanley Crane, former president of the Southern and soon-to-be chairman and CEO of Conrail, that "It may be that technology alone has taken us about as far as it can"—that the future probably holds no technological breakthroughs of the magnitude of the diesel locomotive or the computer-run class yard. We also agree with another great railroad innovator, Santa Fe President Larry Cena, that opportunities for great railroading are still there—that "All we have to do is reach out and grab those opportunities."

In his article in this issue summing up our 1980 series, Senior Editor Gus Welty speculates on how some of these opportunities might be grabbed—by combining modern-day and advanced technology (which we have, to a large degree, although there are still a few frontiers to be broken through) with advanced management methods (which we don't always have) and modernized labor agreements (which we have very few of). Gus's piece starts on p. 22.

RAILWAY AGE

December 8, 1980

FEATURES


Philadelphia-Atlantic City
Highballing the highrollers
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NECIP '80:
Productive shifts in operations and organization

Cover article, page 18

18 NECIP: Productive shifts in operations, organization
Plagued in its early years by organizational chaos and foot-dragging, the Northeast Corridor Improvement Project is now rolling—if not exactly speeding—toward completion. One result is that the newly published NEC schedules are, for the first time, shorter rather than longer.

22 Railroad technology: Review and speculations
Summing up the year-long series of articles that have examined every facet of the industry, Senior Editor Gus Welty writes: "If there is a slackening of interest in taking the technological state of the art and improving it, among railroads or among suppliers, it is nowhere evident."

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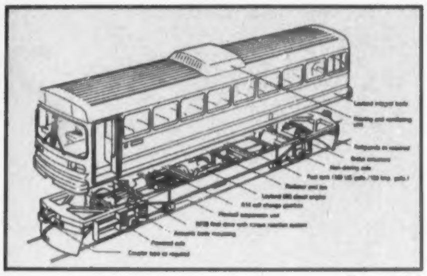
26 Philadelphia-Atlantic City: Highballing the highrollers
The biggest untapped rail passenger market in the U.S. is probably that which has been created by the gambling boom in Atlantic City. A number of organizations are interested in rebuilding and equipping an existing rail line—and one, the French company CGE, is ready to put money up front.



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32 Railbus: A hybrid seeks its niche
The question: Is there a need in the U.S. for rail passenger service in a bus-like vehicle over rural lines that are not maintained to conventional passenger train standards? A New Hampshire experiment with a British Leyland railbus will help turn up the answer.

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COVER: Working at night under catenaries and between a station platform and a moving Amtrak train, an NECIP crew installs a track panel at Metuchen, N.J. Photo by Amtrak staff photographer F. B. DeMers, Jr.

NECIP '80: Productive shifts in operations and organization

By JOHN H. ARMSTRONG
Associate Editor

"Amtrak is undertaking major track rehabilitation on the Northeast Corridor route....Your understanding and patronage are appreciated as we work to bring you a better rail passenger service."

With variations, this message has become an enduring piece of fine print on NEC timetables during the last few years, but as 1980's winter brings its fourth seasonal lull in field work on the NECIP program, some shifts have become evident—in the character of what's going on out on the line, and in the organizational responsibilities behind the concrete mixers, tie tampers, and black-box installers.

Track rehabilitation is past the halfway mark in all major categories and within a few percent of completion in some (see table), and now the first two "section improvement" packages, which will put 57 miles of the route into its intended configuration as parts of the high-speed line, are in effect, with eight more to be contracted for in 1981.

Fundamental to NECIP's current prospects for continuing toward its finale in September 1985 was final enactment of legislation authorizing the $2.5-billion program recommended by DOT's program-restructuring letter of Dec. 7, 1979. Signed last May, the 4R Act amendment added $750 million to the original $1.75-billion program to put into effect the $2.5-billion program (*RA*, Jan. 14, p. 27) that deferred conversion of the Washington-New Rochelle ("South End") electrification from its existing 12-kV, 25-Hz standard to 25kV and 60 Hz but included the high-voltage, 60-Hz North End (New Haven-Boston) electrification as well as adjusting and reinstating numerous alignment, station, service facility, and other program elements.

- **The 1980 season.** As usual, the most readily apparent measure of track program progress is the movement of Amtrak's track-laying machine (TLM) as it spreads aside the rails, scoops up the wood ties, and sets down their concrete replacements. As anticipated, average production per work day has been down somewhat this season (see table) when working in the South End, largely multi-track environment where train traffic density is higher and distances between interlockings are shorter. Season production as of Oct. 24 had reached 75 miles and should approach 90 miles by the time weather closes its work year.

Another big contributor to the slower progress has been the pacing progress of ballast undercutting and surfacing. On the basis of earlier years' experience, 1980's game plan called for undercutting ahead of the track-laying system (TLS) for a head start (on some segments, the season before); the necessary extra surfacing operation was accepted to keep track in service in the interim. On the South End (particularly where trackage previously maintained only for lower-speed traffic is being upgraded to Class 6 to keep trains on schedule while parallel lines are being rebuilt) ballast has often proved to be cemented "practically to Interstate Highway standards," necessitating undercutter chain change-out at intervals as short as two hours. With the preliminary surfacing that was done by the undercutter *un*done in the TLM, accomplishing the entire post-concrete-tie-surfacing in one operation has also slowed this process, sometimes to the extent of limiting the overall TLS production rate; this winter's review may result in devising yet another strategy for next year.

As the 1980 track program comes to a close, long stretches of South End main line of 120-mph quality are in place, upgrading its status as did similar installations in Connecticut, Rhode Island, and

NECIP track program

Item	Unit of measure	1977-'79	1980 (thru 10/25)	Cumulative to date	Total program	% complete
Track-laying system (concrete-tie track)	Track miles	163.6	75.5	239.1	418	57%
Ballast undercutting	"	274.6	60.0	334.6	609	55%
Ballast cleaning	"	217.8	29.0	246.8	399	62%
Wood-tie replacement	Ties	613,288	46,522	659,810	710,490	93%
Continuous welded rail	Track miles	234.4	31.3	265.7	296	90%
Joint elimination	Welds	7,803	552	8,355	11,084	93%

Working at night between platforms at the Metuchen, N.J., station, despite overhead catenaries and passing trains (see front cover), an NECIP crew installs a track panel using the Geismar (Modern Track Machines) Panel Replacement System ("PUMS"). The machine has carried the panel in over auxiliary track and jacked up itself and the panel so the trucks and auxiliary track could be withdrawn. A workman is cutting the ends of the laid rail to assure a close fit when the panel is lowered into place for welding the rails together.

Massachusetts that were completed in 1978 and 1979. So far this season, 37 turnout panels for interlockings have been built up and 43 installed (including some prefabricated last year); this account is the one major segment of Amtrak's program that has continued to greatly exceed unit cost estimates, with a projected cost-at-completion total (based on actuals through September) about 70% above plan.

Amtrak has proved-in turnout exchange with the Geismar Panel Replacement System: "It does exactly what it's supposed to," says FRA's NECIP Director Louis S. Thompson in reviewing project status, "though the crews don't yet have the production efficiency they want. We haven't yet demonstrated that we have the experience in sequencing all the signal work, operations control, track cut-overs, and so on that have to be done at the same time in reconfiguring a major interlocking to do the job efficiently while keeping the railroad alive. That is the part of the program I have to be most concerned about—not whether it can be done or not, but so far as staying on schedule and within the money we have available."

Other "KIPS" (Key Items of Performance) on Amtrak's monthly report print-outs, from TLM and wood-tie renewals to high-speed surfacing and wayside turnout rehabilitation, are generally at, or even well below, unit-cost targets, though production rates have lagged in some cases. Overall cost efficiency vs plan, which on the basis of current methods of calculation was 47% in 1977, 69% in 1978, and 90% by the end of the 1979 season, has remained at 90% so far this year.

A particularly bright spot this autumn has been the essentially total completion of the Hudson River tunnel track work, somewhat ahead of schedule. All track (and ballast) has been replaced on a panel-by-panel, weekends-only basis and then rerailed with cwr. Bringing the speed limit back to 60 mph from 30 on this three-mile stretch saves three minutes for every train on this busiest segment of the railroad. For clearance reasons, this remains a wood-tie section of line.

- **Organization to match the job.** The original "hydra-headed monster" organization of NECIP management among FRA, its "Program Manager" DeLeuw Cather/Parsons, and Amtrak was formally put to death by a Memorandum of Agreement signed in March 1979. This greatly clarified and simplified working arrangements that by that time had become relatively harmonious. Under that first agreement, FRA would let and supervise contracts to do those things (long in the planning/design stages under the shadow of overall program reviews and redirections) that will finally convert sections of the railroad line to new-look status by realigning curves, improving drainage, reconfiguring interlockings, increasing bridge clearances, and placing catenary pole foundations, for example. Amtrak would support these contracts by doing corresponding track-related work with its own forces and contracts.

The impracticability of this approach became increasingly apparent: "There was just no way that such matters as track access on a live railroad could be coordinated with any degree of efficiency." So, in a second agreement of Apr. 16, 1980, which Thompson considers illustrative of the new climate in which the organizations involved no longer consider defense of their turf a priority matter, re-

TLS performance review

	1978	1979	1980 (thru 10/25)
Track miles	41.5	112.1	75
Work days	122	174	138
Miles/day, average	.34	.64	.54
Days more than 0.75 mile	7	64	28
Days more than 1.00 mile	1	22	3

Catenary poles are repositioned for clearance at a realigned curve north of Wilmington.

sponsibility for some $450 million of "section improvement" work was transferred from FRA to Amtrak, which will now award, supervise, and support the implementing contracts.

Section improvement contracting got off to a quick start with the May award to a local firm (Flippo Construction) of a $3.4-million contract; with $1.2 million of Amtrak support, it covers two curve realignments, eight interlocking reconfigurations, 11 bridge rehabilitations, and drainage improvements on the 18.5-mile Landlith to Baldwin section north of Wilmington.

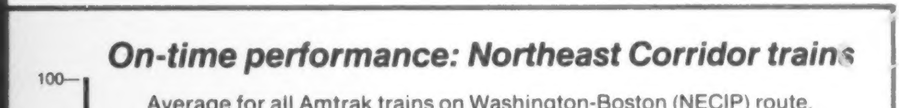
A second section improvement contract covering the 38.2 miles from Washington to Fulton (Baltimore) was let to Peter Kiewit Sons in September; the $11.2-million contract, with $6 million of Amtrak support, will realign 13 curves, reconfigure seven interlockings, rehabilitate one bridge, and improve drainage. It also covers gantlet track and roadway work associated with the New Carrollton station for which ground was broken Oct. 30.

Also let to Peter Kiewit in August was a $4.7-million contract for the first of the corridor's five maintenance-of-way bases. Scheduled for completion in December 1981, the base will occupy a 31-acre site at Odenton, Md.; it includes a 17,000-square-foot building and almost four miles of track.

- **Electrification: First visible signs.** Major construction contracting in the 1981 fiscal year (starting Oct. 1, 1980) includes eight section improvement (SI) items, estimated at a total of $46 million, in territories scattered between Baltimore and Forest Hill, Mass. First visible indications of the North End electrification will begin to appear as concrete is poured for catenary pole bases as part of some '81 SI contracts. With all basic design aspects in hand as a result of the 60% of Electrack's work that has been completed, much of the foundation work for the new electrification can be done by the SI crews, with erection of the poles and catenary following under separate contracts in early 1982. Another aspect of the 1981 SI work on the North End is modification of overhead bridges to accommodate the electrification, with some 40 structures affected.

Signaling design in preparation for major installation work starting next year continues under two massive contracts (South End, GRS; North End, WABCO/US&S), each of which was the biggest ever received by the respective suppliers. The GRS contract, which includes multi-aspect signaling in particularly dense-traffic territory, mostly between Ragan (Wilmington) and New York, continues, but with one shift in plans from those discussed previously (*RA*, Apr. 9, 1979, p. 26). Prototype testing of locomotive and wayside equipment for the six-aspect system—which "everybody" expects to involve no technical problems but which therefore generates a particularly strong desire for the assurance that can come only from full-scale evaluation on a hot railroad—will be conducted in the vicinity of Holly Oak interlocking (Delaware) rather than at Pueblo. By scheduling installation on a segment of the NEC as soon as the first reasonably representative hardware is available, some money can be saved.

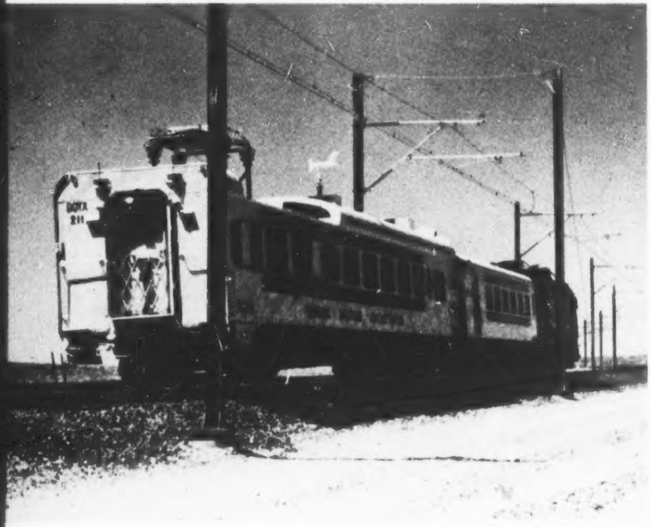
Attracting great industry interest this fall was the competition (bids closed Nov. 18) for the centralized traffic and electrification control (CTEC) system that will supervise train and traction power operations between Washington and Ragan and between New Haven and Boston. It is required to be compatible with both the 25-Hz South End and 60-Hz North End electrifications, since the corridor must

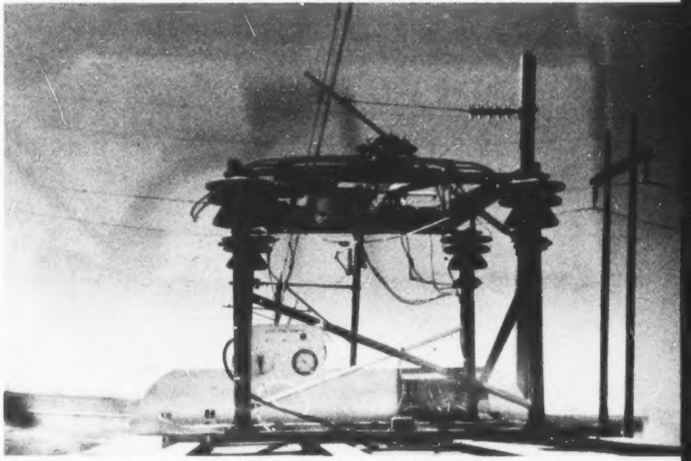


On-time performance: Northeast Corridor trains

Average for all Amtrak trains on Washington-Boston (NECIP) route, Harrisburg and Springfield branches

Data source: Amtrak. ICC on-time criteria.





British-designed high-speed pantograph for AEM-7 locomotives (shown on test car at Pueblo and in closeup) was redesigned for less-stressful extension to NEC's higher-than-European wire.

ultimately be expected to have CTC from end to end, even though the price is too high for the present NECIP. So, the new system must artfully live with all the locked-in cross-talk potentials from a century of engineering decisions (reflected in the various pieces of hardware that will remain in the system) while taking full advantage of today's state of the art, including consideration of the possibilities of locomotive modifications to ease the overall electrical and electromagnetic compatibility problem. In addition to traditional North American signal suppliers, automotive aerospace subsidiaries, communications outfits, and overseas companies in the railway field, in numerous combinations, have entered the competition for procurement, estimated at $20 million. Evaluating responses to the performance-spec solicitation will not be a matter of a few days or weeks.

- **A divide or a plateau?** Amtrak's Oct. 26 timetable represents a definite watershed in the program; for the first time, NEC schedules are shorter rather than longer, with an average of seven minutes coming out of Metroliner schedules, nine minutes from N.Y.-Washington conventional trains, and 10 minutes from Boston-N.Y. Amfleet times. Throughout the 1980 work season the candid scheduling reflected in April's timetable (*RA*, Apr. 28, p. 62) kept on-time performance well above previous summers of discontent and delay (see chart).

What are prospects for further reductions as the track continues to improve? On the North End, where F-40 diesels are hauling trains over many miles of Class 6 track at their current 90-mph limit, major improvement will await electrification; a tantalizing foretaste of the possibilities has been provided by test runs of the LRC train, which has demonstrated an "absolutely gorgeous" ride at 120 mph. The first train inaugurated LRC service between New Haven and Boston on the multistop *Beacon Hill;* the Boston-N.Y. *Shoreliner* is also an LRC, now that the second (and, for the time being, last) LRC is on board.

On the South End—assuming that the learning curve in accomplishing interlocking reconfigurations without disastrous delays stays positive—much depends on the rate of introduction of AEM-7's, scheduled at two a month (from a base of only six locomotives in regular service as of early November). Currently allowed the same 110 mph as Metroliner equipment on Class 6 track, AEM-7's are in effect retiring the few remaining GG-1's, which along with the E-60's are restricted to 80 mph.

Welcome assurance that AEM-7 arrivals *will* result in a continuing invigoration of the service is provided by the results of their endurance test on the 13-mile high-speed test track at Pueblo, which passed the 100,000-mile mark in early November. Running simulated N.Y.-Washington Corridor schedules at a little shorter overall time than the congressionally-directed goal of 2 hours 40 minutes (including stops) with as many Amfleet cars (5 to 8) as available has clearly demonstrated the suitability and durability of the 101-ton, 7,000-hp locomotive while also uncovering enough problems (so far, all fixable) to make the value of the 120-plus-mph test track equally clear. Test runs on the Boston-N.Y. 3-hours-40-minutes simulation did not demand enough performance to be informative and have been dropped. In addition to various nuts-and-bolts and adjustment matters, continued 120-mph running has uncovered a fatigue problem in the original pantograph which will result in substitution of a different model, redesigned to cope with NEC wire heights that result in running at a more stressful pantograph extension than is encountered in European service.

An important offshoot of the AEM-7 testing is demonstration that the existing all-disk Amfleet brakes will survive the 120-mph corridor service, albeit with increased wear. Amfleet equipment will probably be retrofitted with supplementary tread braking (*RA*, Sept. 8, p. 40), but initial high-speed corridor service need not be dependent on this.

- **A matter of balance.** As the predominant NECIP phases continue to shift from planning, design, and emergency fix-ups to final-design construction and service integration, the battle to put the available money where it will do the most good continues on many fronts. In such items as electrification and signaling packages, bids are being broken down into "core" segments of capacity or capability sufficient to handle initial traffic levels, with alternatives meeting prospective requirements of the 1990s broken out separately, so that trade-off options will stay open as long as possible. Technical assurances and management expertise that may help keep this most complex of engineering projects on its new schedule and within budget are developing continually, and the NECIP FRA-DC/P-Amtrak team can use every bit of it in the struggle to build a truly functional corridor the hard way—under traffic and in an environment where some external factor can toss in a curve ball at any time. (What if those air traffic controllers do get sick, and every flight under 500 miles is suspended?) ■

Market

CARLOADINGS

Loadings of revenue freight in the week ended Nov. 15 totaled 445,683 cars according to the Association of American Railroads. This was a decrease of 18,990 cars, or 4.1%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Nov. 15 are estimated at 18.1 billion, a decrease of 1.5% below the corresponding week of 1979.

REVENUE FREIGHT CARLOADINGS

Commodity	**Nov. 15 week**	**Nov. 8 week**
Grain	32.591	36.976
Farm products	5.561	5.473
Metallic ores	25.705	27.077
Coal	112.214	119.434
Crushed stone, gravel & sand	14.685	14.886
Nonmetallic minerals	14.282	15.562
Grain mill products	16.992	16.928
Food and kindred products	17.484	17.945
Primary forest products	20.127	20.258
Lumber & wood products (except furniture)	8.942	9.092
Pulp, paper & allied products	19.290	19.374
Chemicals & allied products	28.884	27.338
Petroleum products	5.386	5.328
Stone, clay & glass products	16.184	15.910
Coke	5.696	5.485
Metals & products	15.445	14.830
Motor vehicles & equipment	20.333	19.713
Waste & scrap materials	13.713	12.917
Forwarder & shipping assn. traffic	10.581	11.230
All other carloads	41.361	41.591
LCL traffic	227	249
Total cars loaded	**445,683**	**457,596**
Cumulative total 46 weeks	**20,121,960**	**21,297,599**
Estimated revenue ton-miles (billions), 46 weeks	**812.9**	**810.6**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Nov. 8 totaled 33,206 cars (9.6% below the corresponding 1979 week) and 60,075 trailers or containers (down 6.0% from 1979). Cumulative volume for the first 45 weeks of 1980 is 1,448,835* cars (down 10.8% from 1979) and 2,631,694* trailers or containers (down 8.2% from 1979).

CANADIAN CARLOADINGS

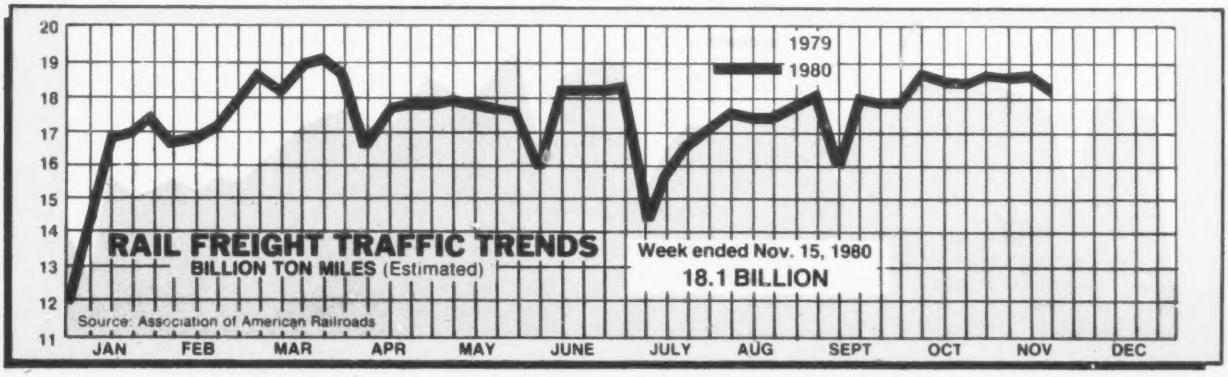
Canadian railway revenue freight loaded in the seven-day period ended Oct. 21 totaled 5.6 million tons (down 6.5% from 1979). Cars loaded totaled 82,359 (down 7.0% from 1979). Cumulative loadings for 1980 were up to 213 million tons (up 0.5% from 1979).

*Revised

• *Norfolk & Western.*—Is building 50 gondola cars in its Roanoke Shops. Production began Nov. 13 and is to be completed in April 1981. At that time NW will shift to production of open-top coal cars and plans to build them at the rate of five per working day throughout the remainder of the year. NW President Robert W. Claytor says that while the entire equipment program for 1981 has not been worked out, "the traffic outlook for the coming year does not justify large equipment purchases." NW estimates its 1980 capital expenditures will total about $147 million—$93 million for equipment and $54 million for roadway improvements.

• *Trailer Train Finance N.V.*—This wholly owned subsidiary of Trailer Train has closed a $40-million deal with investment bankers in Europe to provide Eurodollar financing for acquisition of 920 cars—730 intermodal cars for Trailer Train and 190 boxcars for subsidiary Railbox. The $40 million is in 12-year bonds issued by Trailer Train Finance N.V., which is located in the Netherlands Antilles; proceeds from the sale of the bonds (which are not available to U.S. investors) will be used by Trailer Train Finance N.V. to buy equipment trust certificates issued by Trailer Train and Railbox. The certificates will become collateral for the Eurobonds. Trailer Train notes that the cars will be acquired from U.S. builders and that European investors will not have a direct interest in them. The trustee of the equipment trust, a U.S. bank, Trailer Train says, will have a security interest and will receive payments from Trailer Train and Railbox in amounts which, over the 12-year life of the equipment trust, will pay the principal, interest, and expenses of the trust. Trailer Train President Curtis D. Buford commented: "While some U.S. companies have utilized Eurodollar financing, this transaction is the first of its kind to be secured by equipment trust certificates....We undertook this Eurodollar financing in order to broaden the base of our available sources of capital. We expect to avail ourselves of the Eurodollar market on a regular basis when conditions warrant, but we'll continue to finance the greater share of our acquisitions in the United States."

• *Wisconsin & Southern.*—Has received grants and loan guarantees totaling $5.5 million to be used for purchase of new maintenance equipment and locomotives; for rehabilitation of its right of way; and as working capital. W&S is a subsidiary of FSC Corp. of Pittsburgh. Its line runs from North Milwaukee to Oshkosh. Supplying the funds are the Federal Railroad Administration, with a grant of $2.8 million; the Wisconsin Department of Transportation, with a grant of $691,745; and the Farmers Home Administration, which has guaranteed a loan in the amount of $2 million. The railroad will supply an additional $864,700 for track rehabilitation.



Car leasing: The gravy train derails

December 29, 1980

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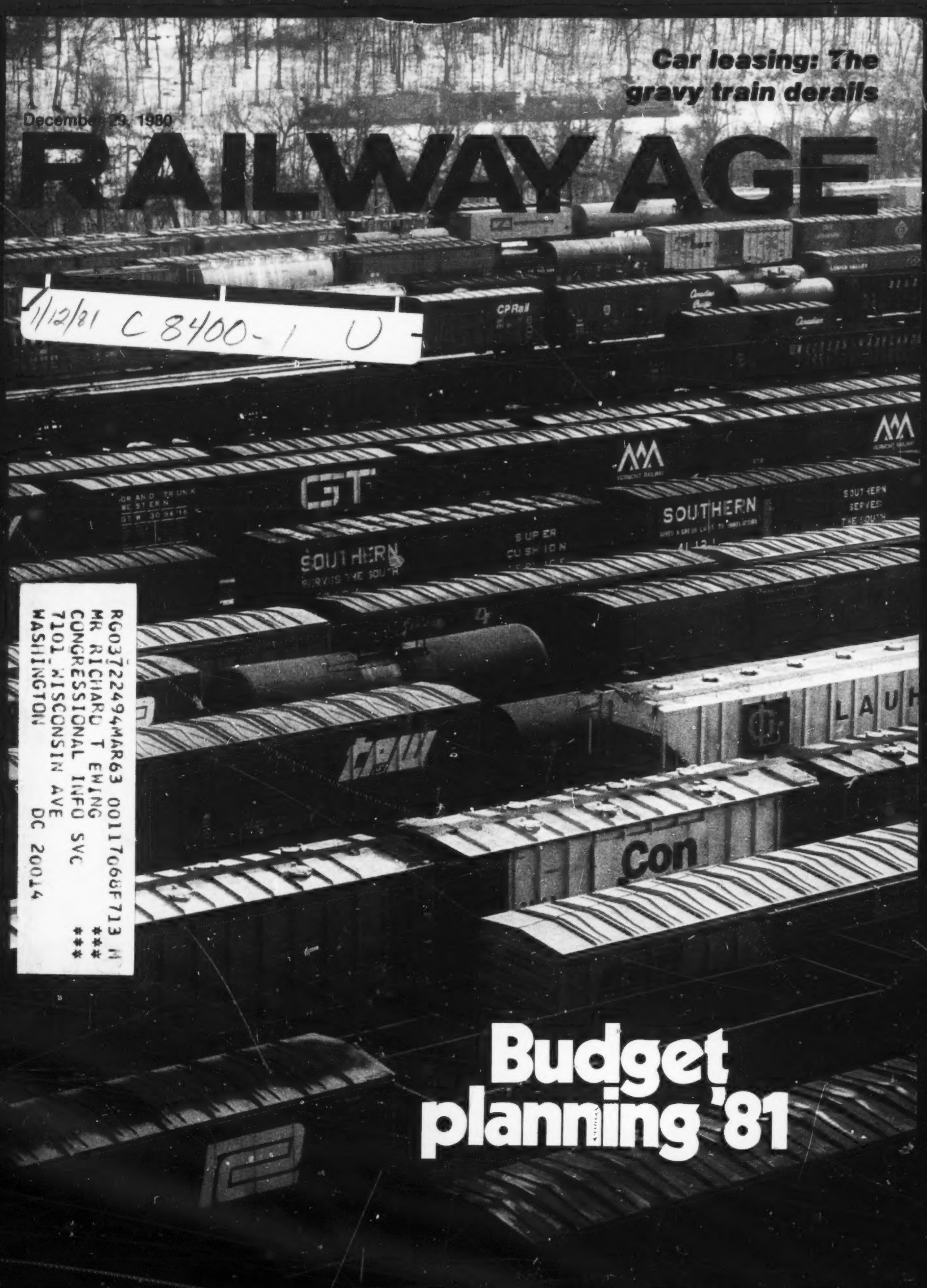
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Budget planning '81

RAILWAY AGE

USPS 449-130

December 29, 1980 • Vol. 181, No. 24

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Railway Age descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U S Patent Office and Trade Mark Office in Canada.

Published semi-monthly by the Simmons-Boardman Publishing Corporation 508 Birch St Bristol Conn 06010. Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U S possessions Canada and Mexico $10 one year $16 two years all other countries $25 one year. All other subscribers in the U S Canada and Mexico $20 one year all other countries $35 one year. All subscriptions payable in advance. Single copies $1 plus postage and handling except special issues. Copyrighted © 1980

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept. Railway Age P O Box 530 Bristol Conn 06010.
Change of address should reach us three weeks in advance of next issue date. Send old address with new enclosing if possible your address label. Post Office will not forward copies unless you provide extra postage.

Member of

Printed at Hughes Printing Co 34 North Crystal St East Stroudsburg PA 18301. Controlled circulation postage paid at East Stroudsburg PA and at Bristol CT.
POSTMASTER—SEND FORM 3579 TO P O BOX 530 BRISTOL CONN 06010

Inside

LUTHER S MILLER

CAPITAL SPENDING: UPS AND DOWNS

Just a couple of months ago the winds of recession appeared to be abating, and a chilled national economy was showing signs of thawing. Now, the economists are saying that the warmer climate evident in October was, after all, only an Indian summer. By mid-December, those handmaidens of hard times—sluggish business and costly capital—were back on the scene.

Generally speaking, the railroads outperformed the economy during most of 1980; for the first three quarters of the year, at least, they made a most respectable showing (p. 10). But they are not immune to the nation's economic woes, and railroad capital spending budgets for 1981 reflect the cautious approach to capital investment that all business must take in times like these. The best forecasts now available—from the Association of American Railroads, from individual carriers, from the American Railway Car Institute, and from other railway suppliers—suggest that expenditures in 1981 may be 30% below 1980 levels.

There is a bright spot in this dreary picture, and it is this: Railroad spending in 1980 was extraordinarily high—around 90,000 freight cars and 1,700 locomotives were installed. So a drop of even 30% will not really be catastrophic. The American Railway Car Institute is predicting that around 58,500 new cars will be installed in 1981 (though some find that figure a little high); about 1,000 new locomotives will be installed. As recently as 1976, only 52,000 new cars and 567 locomotives were installed.

Railway Age's year-end capital spending survey is summarized in the article beginning on p. 22. It includes the detailed spending plans of railroads accounting for about half of all Class I mileage.

That article is followed (p. 25) by another that is singularly appropriate at this time. In the second article, Jerry Lutes of Ernst & Whinney and John S. Harman of the U.S. Department of Transportation thoughtfully examine the bases on which railroads evaluate capital projects. "In the past," they write, "faulty analysis procedures have sometimes resulted in misleading rates of return and expensive investment mistakes." The authors go on to describe procedures developed by sophisticated roads that can help budget planners everywhere avoid some of these costly mistakes.

A third article, by consultant Walter H. Pogue, Jr., explains why there is not likely to be a large market in the immediate future for new boxcars. "The gravy train derails" (p. 34) is the story of the rise and fall of the per diem boxcar.

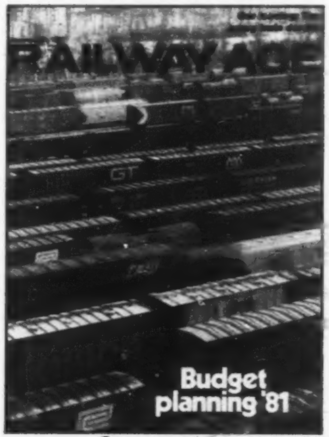
THE "RAILROAD" YOU NEVER HEARD OF

"The nation's railroads" is a term used by the Association of American Railroads to describe the Class I carriers. "Short-line railroads" is a term that covers most of the other railroads normally included in railroad statistics. But there is another railroad complex that comes under neither of these rubrics, although it is as big as many Class I's. It is, in fact, not a railroad at all; it comprises the trackage and the equipment of several hundred private industries. This industrial railroad complex adds up to more than 12,000 miles of track; it has a fleet of 334,000 freight cars and 2,600 locomotives; and it is one of the major (though rarely identified) buying influences in the industry. It is the subject of a detailed report—"The 1981 Survey of Industrial Owners of Railway Track and Equipment"—compiled by the market research department of *Railway Age*. For details, see the ad on p. 20.

RAILWAY AGE

December 29, 1980

FEATURES



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Business is down, and capital costs are high—so railroads, for the time being at least, are scaling down their investment plans for 1981. Spending is now pegged at something over $4 billion—a 30% drop from 1980 levels.

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Railroads in the U.S. and Canada reported 54,000 separate acts of vandalism last year. There's a growing belief among security people that "soft" courts, which now let many vandals off lightly, need to adopt a tougher stance.

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COVER: Freight cars in Conrail's Allentown (Pa.) Yard were photographed by Don Ball, Jr.

Nine-month earnings top $613 million

Class I railroads have reported ordinary (net) income of $613.1 million, on operating revenues of $20.7 billion, for the first nine months of 1980. In the comparable 1979 period, they netted $554.9 million on operating revenues of $18.5 billion. Net railway operating income in this year's first three quarters was $669.7 million, up from $560.8 million in 1979. The rate of return on investment for the 12-month period ended Sept. 30 rose to 3.17% from 2.64% a year earlier.

A slight economic upturn in the third quarter, coupled with rate increases, helped account for the industry's improved performance. Net income in this year's third quarter came to $156.1 million, up from $60.7 million in the comparable 1979 quarter. The biggest third quarter improvement came in the West, where net income rose to $185.8 million in 1980 from $78.7 million in 1979. Southern roads increased their third-quarter net earnings to $80.8 million from $68.7 million a year earlier. Eastern roads showed a decline, with their collective deficit rising to $110.5 million from the $86.7 million posted in 1979.

For the first nine months of 1980, nine railroads reported deficits in net income—six in the East, two in the West, and one in the South.

CLASS I RAILROADS IN THE UNITED STATES[2]

For the third quarter

		1980 (millions)		1979 (millions)
Operating revenues		$ 6,994.8		$ 6,403.8
Operating expenses		6,623.2		6,249.8
Income taxes on ordinary income		63.4		54.7
Provision for deferred taxes		93.5		29.6
Net railway operating income				
United States		222.1		75.1
Eastern District	Def.	88.9	Def.	101.3
Southern District		86.9		82.0
Western District		224.1		94.4
Ordinary net income[1]				
United States		156.1		60.7
Eastern District	Def.	110.5	Def.	86.7
Southern District		80.8		68.7
Western District		185.8		78.7

For the first nine months

Operating revenues		$20,740.7		$18,501.0
Operating expenses		19,672.0		17,668.5
Income taxes on ordinary income		186.9		153.3
Provision for deferred taxes		231.8		135.0
Net railway operating income				
United States		669.7		560.8
Eastern District	Def.	98.8	Def.	147.3
Southern District		300.1		250.5
Western District		468.4		457.6
Rate of return*				
after provision for deferred taxes		3.17%		2.64%
Ordinary net income[1]				
United States		613.1		554.9
Eastern District	Def.	96.9	Def.	103.5
Southern District		278.0		225.3
Western District		432.0		433.1

Def. = Deficit *Rate of return for 12 months ended Sept. 30

[1] Income before extraordinary items [2] All data exclude Chicago, Rock Island & Pacific Railroad

Mexico opts for smaller landbridge

Mexico's dream of a railroad landbridge short-cutting the Panama Canal is about to come true, though on a scale far smaller than some of its early promoters had envisioned.

The Ministry of Communications and Transport, the Mexican National Railways (NdeM), and private investors are together spending $39.5 million to rehabilitate and re-equip an existing 188-mile rail line between Coatzacoalcos on the Gulf of Mexico and Salina Cruz on the Pacific, and to build container port facilities and switch yards at both ends of the line. Orders have been placed for 10 2,250-hp diesel-electric locomotives to be supplied by General Electric, and 140 TTX-type 89-foot flatcars.

The service is scheduled to begin next spring, initially with one train a day in each direction (two locomotives, 20 flatcars and a caboose). Eventually it is planned to operate three trains a day in each direction.

The project is far less ambitious and costly than one proposed several years ago by a group within NdeM headed by Eduardo Harfuch. The Harfuch plan—price-tagged at $800 million in 1973 dollars—called for construction of a new double-track, electrified railroad capable of moving 100-car, 5,000-ton container trains across the Tehuantepec Isthmus at average speeds of 60 mph (*RA*, Oct. 25, 1976, p. 32). The new line would have had a maximum grade of less than 1%, compared with the 2.2% maximum grade of the existing line.

The scaled-down project has not met with universal approval. "It is too small to really demonstrate the potential of a landbridge," complains one NdeM officer. "It's as if the builders of the Panama Canal had said, 'We will first dig a small ditch to see if it works.'"

It's estimated that the Coatzacoalcos-Salina Cruz landbridge will save three to four days in transit time for freight that would otherwise move through the Panama Canal. This timesaving, landbridge proponents claim, will more than compensate for the slightly higher cost of diverting freight from the canal to the railway.

Defenders of the scaled-down project point out that the landbridge is intended to do more than siphon some traffic from the canal. They say it will also spur industrial development in the impoverished Tehuantepec Isthmus and will ease the transportation problems of Mexico's export and import industries.

The Ministry of Communications and Transport is providing $13.8 million of the capital funds; this is being used for port construction and roadway rehabilitation. The railroad is supplying $15.2 million, mostly for locomotives and cars. The private sector is investing $10.5 million in

Budget planning '81

Roy H. Blanchard

Railroad capital spending next year will again be in the multibillions—but until traffic picks up, the signals are against any major expansion of equipment programs.

Capital budgets for 1981 are beginning to trickle out of railroad boardrooms—and most of them carry the bearish stamp of the recession.

Informed sources are now estimating that investment in railroad capital improvements in 1981 will total around $4.3 billion, a decline of about 30% from the estimated $6.2 billion spent in 1980.

That decline, it should be emphasized, does not represent any long-range pessimism within the industry. There is, in fact, considerable optimism in the air. The recession has not cut as deeply into railroad revenues and profits as many had feared. Meanwhile, thanks to the Staggers Rail Act of 1980, the railroads are moving into a milder regulatory climate than they have enjoyed in nearly a century.

But budget planning for 1981 has had to take into consideration short-term trends that affect all business, the most important of which is the soaring cost of investment capital during a period of business downturn. In the case of the railroads, the smaller 1981 budgets also reflect the fact that purchases of both freight cars and locomotives have been unusually strong in the last two or three years, and only the most essential purchases must now be made.

- **New equipment: Down.** Nine railroads that account for nearly half of all Class I mileage in the U.S. have made their detailed 1981 capital programs available to *Railway Age*. These railroads purchased 964 locomotives in 1980; they expect to buy 449 in 1981. They installed 18,313 new freight cars in 1980; they expect to install 13,673 in 1981. (Conrail is one of the 9 railroads whose 1981 equipment programs are included in these figures. Conrail emphasizes that its 1981 budget depends upon "obtaining necessary funding from the federal government...and on the necessity for the equipment based on customer requirements." Conrail's program calls for 100 new locomotives in 1981, vs 18 actually acquired in 1980, and 3,679 new freight cars. If Conrail's 1981 equipment plans fail to come to fruition, the decline in railroad investment next year will be steeper than the above figures indicate.)

Not only will equipment purchases by Class I railroads be down, but purchases by nonrailroad investors will drop even more sharply. Some of the big freight car buyers of just a year or so ago—Itel and National Railway Utilization Corp., for example—are now more eager to get rid of cars than to acquire them.

Just what all of this means for 1981, in hard numbers, is difficult to pin down. A more or less "official" forecast for 1981 calls for the installation of 58,500 new cars, down from the estimated 90,000 that were delivered and installed in 1980.

Capital budgets, 1981 vs 1980

	Estimated 1980 (millions)	Projected 1981 (millions)	% Change
Burlington Northern	$566.6	$308.7	−46
Chicago & North Western	349.1	241.2	−31
Conrail*	455.0	844.0	+85
Denver & Rio Grande Western	19.0	8.0	−58
Frisco	53.0	31.0	−42
Illinois Central Gulf	268.0	300.0	+12
Kansas City Southern	49.0	35.0	−29
Missouri Pacific	280.0	225.0	−20
Norfolk & Western	144.8	131.1	− 9
Santa Fe	278.3	258.1	− 7
Union Pacific	375.8	199.1	−47

*Includes capitalized maintenance; total subject to governmental approval of financing.

But two major carbuilders think that figure is too high; they're looking for no more than 45,000 new cars installed in 1981. *Railway Age's* own estimate is 50,000 cars installed. As for new car orders to be placed in 1981, estimates range from one builder's guess of around 33,000 to more optimistic forecasts of up to 50,000.

Locomotive deliveries will also be down substantially—from an estimated 1,700 in 1980 to no more than 1,000 in 1981.

● **Maintenance: Up.** One expense that will be up in 1981 is maintenance, mostly because this is an operating item that railroads cannot control as tightly as they control capital spending. The 10 roads reporting to *Railway Age* estimate that they will spend $2.7 billion on maintenance of equipment in 1981, up from $2.3 billion in 1980; and $2.2 billion on maintenance of roadway and structures, up from $1.9 billion this year.

Following is the road-by-road picture of capital investment programs for 1981, as developed by *Railway Age:*

Burlington Northern, Inc., plans consolidated capital expenditures in 1981 (excluding Frisco, with which it recently merged) of $308.7 million, down from $566.6 million in 1980. The 1981 budget calls for $144.4 million for equipment (compared with $381 million in 1980) and $164.3 million for fixed plant ($185.5 million in 1980). BN plans to acquire 55 locomotives and 1,500 new freight cars in 1981, compared with 280 locomotives and 2,961 freight cars in 1980. Maintenance of equipment spending is estimated at $835 million for 1981, up from $686 million in 1980; and m/w and structures spending is estimated at $690 million for '81, compared with $615 million in '80.

(Frisco's 1981 capital expenditures are now estimated at $35 million; no breakdown has been given. Prior to its merger with Burlington Northern, Frisco had prepared a capital budget of $57 million for 1981, compared with $53 million in 1980.)

Conrail, which unlike most railroads capitalizes its maintenance expenses, has prepared a capital budget of $844 million for 1981, compared with $455 million actually spent in 1980. Equipment is budgeted at $391 million in 1981, up from $127 million in 1980, and fixed plant is budgeted for $463 million, up from $318 million—depending, as noted, upon the availability of financing and upon customer need. In addition to the maintenance expenses that are capitalized, Conrail plans to invest $121 million in equipment maintenance in 1981, compared with $118 million estimated for 1980.

Chicago & North Western has a total capital budget of $241.2 million for 1981, compared with $349.1 million actually spent in 1980. The '81 program calls for $138.9 million for equipment and $102.3 million for fixed plant, compared with $272.9 million for equipment and $76.2 million for plant. C&NW's 1981 equipment program includes 68 locomotives and 3,000 freight cars; in 1980 the railroad acquired 73 locomotives and 6,311 freight cars. (C&NW's expanded fixed plant program for 1981 calls for continued rehabilitation of its east-west main line, replacing 115- and 112-pound rail with 136-pound rail and installing new ties, anchors, and ballast; 120 miles of new cwr to replace 112-pound rail; installation of 130 miles of 112-pound cwr to replace 100-pound rail, plus anchors and tie plates; installation of 450,000 new and 184,000 reusable crossties; placement of 225,000 cubic yards of ballast; and extension of microwave 654 miles from southern Minnesota to Kansas City.) For maintenance of equipment, C&NW has budgeted $144 million in 1981, compared with $130.9 million in 1980; and for m/w and structures, $156.3 million, up from $131.5 million.

Denver & Rio Grande Western is trimming its 1981 capital budget to $8 million, less than half the $19 million spent in 1980. D&RGW, which acquired 16 locomotives in 1980, plans no equipment purchases in 1981. Fixed-plant expenditures, however, will rise to an estimated $8 million in 1981 from the $5.3 million spent in 1980. Rio Grande will install 56 track miles of new rail. Equipment maintenance spending is budgeted at $54 million in 1981, up from $48.5 million in 1980; m/w and structures spending will rise to $51 million from $46 million.

Illinois Central Gulf had not completed its 1981 capital budget in mid-December, but a spokesman said next year's program would be substantially higher than the $268 million spent in 1980, probably in excess of $300 million. In 1980, ICG invested $162 million in fixed-plant improvements and $106 million in equipment. ICG's equipment maintenance expenditures added up to $160 million in 1980, m/w and structures to $110 million.

Kansas City Southern has earmarked $35 million for 1981 capital projects—$22 million for equipment (12 locomotives and 230 freight cars) and $13 million for fixed plant (of which $11 million will go for rail relay, ctc, and related projects; $2 million for mechanical facilities and other structures). In 1980, KCS had a capital program totaling $49 million—$32 million for equipment (six locomotives and 600 freight cars) and $17 million for fixed plant. For equipment maintenance, KCS plans to spend $25 million in 1981, compared with $20 million this year; for m/w and structures, $50 million, up from $45 million.

Missouri Pacific's 1981 capital expenditures are now estimated at $225 million, compared with $280 million in 1980. For equipment MoPac will spend $150 million (100 locomotives and 2,150 freight cars), down from $212 million in 1980 (192 locomotives, 2,371 freight cars). Improvements will include construction of 7.6 miles of second main track from Osawatomie to Lane, Kans.; relaying 232 miles with new 136-pound cwr; relaying 157.8 miles with relay 115-pound and 112-pound cwr; construction of 4,974 feet of new bridges, replacing 5,991 feet of old bridges; extension of nine sidings and construction of five new sidings at various locations; competion of yard improvements at Houston, Kansas City, Osawatomie, Coffeyville, St. Louis, and Dupo; construction of a new storage-in-transit yard at Livonia, La.; installation of 88.7 miles of ctc between Spring, Tex., and Valley Junction; extension of mirowave; construction of a new overhead crane piggyback facility at East Dallas;

(Continued on page 57)

Budget planning '81

(Continued from page 23)

and expansion of the DeSoto truck shop. Fixed-plant spending will rise to $75 million from the $68 million invested in 1980. MoPac will lay out $432 million for equipment maintenance in 1980, up from $377 million; $281 million for m/w and structures, up from $245 million.

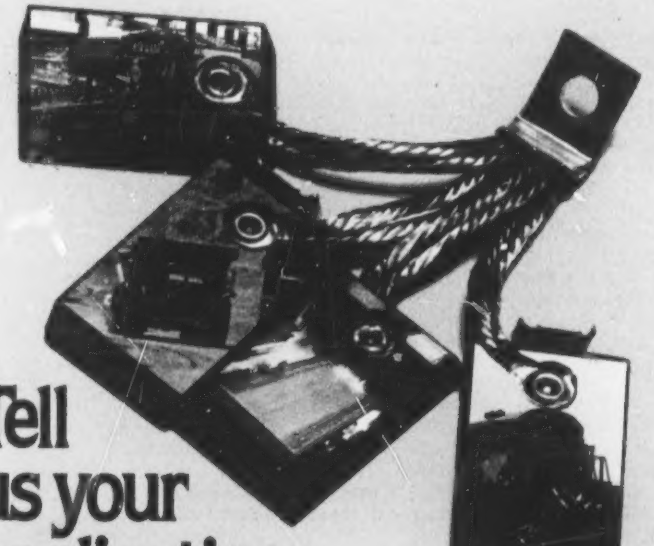
Norfolk & Western's 1981 capital budget of $131,063,000 includes $66,745,000 for equipment (six locomotives and 1,538 freight cars) and $64,318,000 for fixed plant. In 1980 NW invested $94,177,222 in equipment (25 locomotives, 1,459 freight cars) and $50,572,700 for fixed plant.

Santa Fe has programmed capital expenditures totaling $258.1 million in 1981, a slight drop from 1980's $278.3 million. Santa Fe's '81 equipment program is budgeted at $151.1 million and includes 60 new locomotives (30 of which are carried over from its 1980 program), 124 rebuilt locomotives, 406 new freight cars (301 carried over from '80), and 928 rebuilt cars. In 1980, Santa Fe spent $188.3 million on equipment—110 new locomotives plus 85 rebuilds, and 1,079 freight cars. For fixed plant Santa Fe has budgeted $107 million, up from $89.9 million in '80. Major projects include the laying of 436 miles of welded rail (92 miles of which are carried over from 1980); installation of 154 miles of ctc between Gallup, N.M., and McCartys; completion of the new Flynn Yard at Oklahoma City; extension of eight sidings to accommodate unit coal trains; renewal of 1.86 miles of bridges; and addition of five million gallons of storage capacity for diesel fuel. Equipment maintenance will cost Santa Fe an estimated $517 million in 1981, up from $465 million; m/w and structures, $417 million, up from $350 million.

Union Pacific's 1981 capital budget, $199.1 million, is down substantially from the $375.8 million actually spent in 1980. For equipment—including 40 locomotives and 1,100 freight cars—UP has budgeted $88.6 million. This compares with $290.3 million spent in 1980 for 230 locomotives and 1,753 freight cars. But UP's fixed plant expenditures will increase from $85.5 million in '80 to an estimated $110.6 million. Fixed-plant projects include acquisition of various Milwaukee Road properties for $19 million and construction of a classification yard at Yermo, Calif., for $9 million. UP expects to spend $455.7 million for equipment maintenance in 1981, compared with $397.3 million in 1980; for m/w and structures, $364.9 million, up from $314.2 million.

Southern Railway has not yet announced a complete capital program for 1981, but it has already placed orders for $156 million worth of equipment. Southern has ordered, for 1981 delivery, 40 locomotives from General Electric and 20 from EMD, plus 2,900 freight cars—800 covered hoppers, 100 covered gondolas, and 100 wood chip hopper cars, all from Greenville Steel Car; 800 covered hoppers from Pullman Standard; 300 limestone hopper cars from Ortner; and 700 pulpwood cars and 100 flatcars from United-American Car Co.

In Canada, CN Rail has announced a $500-million capital program for 1980, up from $425 million this year. CN's 1981 equipment outlays, estimated at $126.2 million, will cover acquisition of 10 new and 12 rebuilt locomotives and 1,639 freight cars. In 1980 CN spent $112.2 million for 40 locomotives and 950 freight cars. CN plans to increase fixed-plant spending from $312.8 million in 1980 to $373.8 million in 1981. CN's equipment maintenance will cost around $614 million in 1981, compared with $536 million this year; m/w and structures spending will rise to $348.7 million from $304.4 million. ■



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Two teenagers confessed to causing this recent FEC derailment at Vero Beach, Fla.—but a judge let them go free.

Vandalism: Time to crack down

By LUTHER S. MILLER, Editor

Hooligans have been harassing the railroads ever since the first puffing steam engine presented an irresistible target to a country lad with a rock in his hand.

A century ago the pages of *Railway Age* were peppered with reports of vandalism. Bands of "wild Indians" raided the encroaching tracks of the Chicago & North Western and the Milwaukee Road in the Dakota Territory. Professional trainwreckers flourished in the West. Amateur vandals flourished everywhere.

Today the red menace has faded, and train-wrecking has become more of an accident than an art. But the vandals are still busy—a handful of professionals looking for loot, a host of amateurs looking for a thrill. The AAR counted more than 54,000 acts of vandalism last year, and that figure is probably understated. The vandals are particularly active in the great urban sprawls of the East and the Midwest, where commuter trains and freight yards present attractive trargets. But no road is totally safe from their depradations, no train crewmen enjoy total protection from their rocks and bullets.

● **"A fortune for security."** Take, for example, the Florida East Coast. No railroad, perhaps, has worked harder than FEC to provide maximum security for its people and its property. Vigilance is more than a watchword on FEC; it is a commandment, and has been since the days, not very long ago, when the railroad was subjected to extraordinary acts of violence during a long and bitter strike. Labor peace has long since returned to the railroad, but the lessons learned during the period of strife have not been forgotten. These lessons are enormously beneficial to FEC's employees and customers.

"We spend a fortune for security," says Senior Vice President Ray Wyckoff. "We have guards at all strategic points. Our property protection people are radio equipped. We have outside forces to protect road equipment. And where we know we have a problem—at West Palm Beach, for example, and in the Miami area—we regularly hire outside security people."

Nonetheless, the files in Wyckoff's offices are replete with instances of vandalism:

"Crosstie placed on track, camouflaged to indicate a large pile of dirt."

"Steel strap placed across southbound main line, resulting in malfunction of crossing gates."

"Foreign object thrown at locomotive." (This is the single most frequent entry.)

"Loading pallets and barrels placed on tracks."

"Switch lock damaged."

"South arm of signal gate stolen."

"Crossing gate removed."

Some incidents are more serious than others:

"Engineer on southbound train Miami area received head injuries from rock thrown through screen on engineer's side of locomotive."

"Engineer in West Palm Beach area struck by fragments of bottle thrown from local tavern; it hit mirror on engineer's side of locomotive and pieces of bottle came through screen."

For locomotive crews everywhere, the most unnerving acts of vandalism have been those involving the hurling of "foreign objects" through locomotive windshields, sending splinters of glass flying through the cab.

● **Safety glass.** Shattering glass is no longer a problem on the FEC. Long before the Federal Railroad Administration made the installation of safety glass mandatory (see p. 56), the FEC had moved on its own to afford its crewmen this protection. Now all of the railroad's locomotives are fitted with optic-quality Triplex or Sierracin glass that has met or surpassed the FRA requirement that it be able to withstand the impact of a speeding bullet or of a 24-pound concrete block traveling at 30 mph. In a successful test, the concrete block shatters; the glass doesn't. Altogether, the nation's railroads are spending around $75 million to retrofit their locomotive fleets with this high-quality glazing, plus millions more to reglaze their cabooses. It is a program that has the enthusiastic support of management and labor alike. In an unprece-

Reported incidents of vandalism, 1979 and 1978*

	1979		1978	
Category	Incidents	Arrests	Incidents	Arrests
Multilevel cars	22,488	165	29,878	249
Company property and equipment	5,549	934	5,096	797
Track and signals	5,788	652	5,823	563
Switch tampering	1,446	312	1,718	347
Track obstruction	7,329	897	7,695	742
Stonings	8,262	1,758	9,008	1,809
Shootings	777	257	757	306
Other	2,574	412	2,947	419
Totals	54,213	5,387	62,923	5,232

*Based on reports to the AAR from railroads representing 74% of total railway mileage in the U.S. and Canada.

dented action, the Association of American Railroads and the brotherhoods joined in asking the FRA to initiate the rule-making proceeding that led to the new standards.

But while safety glass will help solve the single most serious problem—personal injuries to crews and passengers, of which 435 cases were reported in the U.S. and Canada last year—it is harder to find remedies for some of the more extreme acts of vandalism. One of these took place on the FEC just a few weeks ago.

- **"Big hole!"** Oct. 1, 1980, is the date of the first entry on this incident: "Extra 424 North with the count of 19 0 70 did collide with several loaded gondolas at the Russell Concrete siding in Vero Beach (Milepost 228.4) after a switch was opened by vandals."

Robert O. Vest, superintendent of general claims and property protection for the FEC, reported:

"The switch leading to the siding at Russell Concrete was in the open position, causing the Extra 424 North to proceed into the siding and strike several loaded gondolas, resulting in derailment. The switch lock had been forceably removed and the switch handle thrown to the open position....

"J. E. Kight stated that his job on the train Extra 424 North was conductor. He was running the engine at the time of the derailment. Kight has been employed with the FEC for the past 15 years, with 12 years experience as an engineer. He has not been involved in any similar incident while employed by the railroad.

"Kight stated that the X-424-N proceeded north from Ft. Pierce at approximately 7:40 p.m., Oct. 1, 1980....As the train rounded a curve south of Vero Beach, Kight observed a clear block signal at Milepost 231.6. As the engine traveled over the 12th St. crossing, the block signal dropped red in his face and he set the brakes. The train was traveling between 35-36 mph. The engine light illuminated the switch and he observed that the switch was open. Kight yelled 'Big hole!' as the train brakes were set into emergency stop. The train went over the switch into the siding. Kight dropped to the floor. Kight stated that the train was approximately 200 feet south of the switch when he observed the open switch. Leslie Davis [engineer] was on the west side of the engine. He went flying forward as the train hit the cut of cars in the siding...."

"To be perfectly frank, I though we were dead," Kight said later.

Luckily, both crewmen escaped serious injury. As much could not be said for the train. Damage was estimated at close to three-quarters of a million dollars.

Two suspects were quickly apprehended—a couple of teenage boys who saw the wreck and graphically described it to a radio reporter. In separate interrogations, each finally confessed to helping the other throw the switch that sent Extra 424 North crashing into the siding. But a judge threw out both confessions, and the boys went free.

Wyckoff has seen this happen before, and he reacts with quiet exasperation. "The justice system has got to be changed," he says. "It doesn't seem to make any difference how many you take into court. You know the majority will get away with no more than a slap on the wrist. We get the same vandals back three or four times."

- **A grim national picture.** What is happening on the FEC is only a small part of a national vandalism picture that can only be described as grim. FEC, as noted, is actually one of the best-protected railroads to be found anywhere; it is also a railroad whose officers are not afraid to speak out on the problem. On some other roads, the subject is almost taboo, with the result that the AAR's Safety and Special Services section has difficulty collecting complete statistics on the extent of the problem. But the statistics that the AAR does collect, from railroads representing nearly three-fourths of the total Class I mileage in the U.S. and Canada, are chilling enough.

Last year, 54,213 separate acts of vandalism were reported to the AAR, a decline from the 62,923 incidents reported in the previous year, but nothing to be complacent about. There were 5,387 arrests reported last year, including 4,423 juveniles; in 1979 there were 5,232 arrests, including 4,413 juveniles. The number of convictions is not a matter of record, but it is believed to be relatively low. Railroad security people everywhere share Ray Wyckoff's complaint about the softness of judges dealing with juvenile offenders.

The biggest single target of vandals is multilevel auto carriers; 22,488 incidents were reported in 1979, down from 29,878 in 1978 (a reduction due partly to the fact that an increasing number of these carriers are fully enclosed, therefore less attractive to rock-throwers, and partly to the fact that there were fewer targets last year due to the slump in motor vehicle traffic).

After the multilevels, random stonings of trains comprise the next biggest category—8,262 such incidents in 1979. The smallest category is shootings (777 in 1979), but it is also the most serious.

- **Why?** It would take a regiment of sociologists and psychologists to probe the "why" of this senseless assault on human lives and property.

"It seems to be a reflection of the times," says Marvin Pelon, the AAR's assistant director of special services. "People see trains as symbols of power and authority, and they vent their frustrations by attacking them. There is also, of course, the problem of kids with nothing better to do."

What are the solutions?

High-standard safety glass is obviously a solution to part of the problem, but it does not afford total protection. In warm weather the windows of locomotives must be open; screens then become the only protection. And, as AAR's Pelon points out, "When the conductor leans out of the bay window of his caboose to inspect his train, he becomes a target."

Fencing can be a deterrent, but again not a foolproof one. "The next thing you know," says Pelon, "they have vandalized the fences."

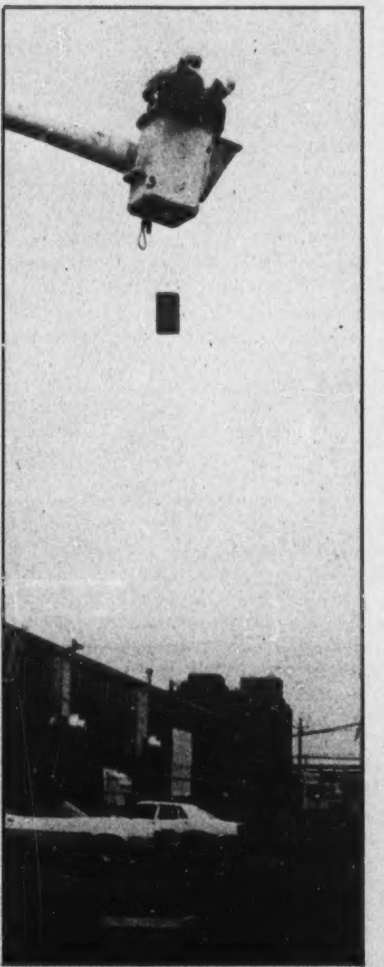
Pelon believes a good long-range solution is a continuing education campaign to cut down on trespassing. "Vandalism is often a crime of opportunity," he points out, "and trespassers are presented with that opportunity."

Last year 46,757 persons were arrested for trespassing on railroad property, and another 393,921 trespassers were removed from the property and released with a warning. The comparable figures for 1978 were 32,693 arrested and 339,312 warned.

As one way of trying to discourage trespassing, the AAR provides a film, "The Right Track," for showing to youth and community groups. Amtrak, which has a particularly severe vandalism problem in the Northeast Corridor, has its own film, "No Second Chance."

But the best deterrent to vandalism will come, Ray Wyckoff and many others believe, when judges decide to make the punishment fit the crime—and let vandals know they will not soon have a second chance to imperil lives and destroy property. ■

Protective glazing: Meeting FRA's new standards



FRA requires windshield glazing tests like this, in which a 24-pound cinder block is dropped with 30-mph impact speed; the glazing must allow no penetration by the block. Photos from Rohm & Haas.

The most mindless and cruel forms of vandalism are the attempts to kill and injure railroad passengers and crew members by shooting bullets and throwing rocks at moving trains. An alarming number of these incidents are occurring—over 9,000 in 1979, of which almost 800 were shootings.

To protect crews and passengers, FRA one year ago established a set of minimum safety requirements for windshields and side windows on locomotives, passenger cars, and cabooses. In essence, the new rules require glazing materials to be bulletproof, impact resistant, and shatterproof:

- Windshields and side glazing must be capable of stopping a standard 22-caliber long rifle bullet 40 grams in weight at 960 feet per second.
- Windshield glazing must survive center impact from a cinder block of 24 pounds at 44 feet per second (30 mph). The corner of the block must hit the glazing and make no inside surface penetration.
- In the above test, no glass fragments (spall) can fly off the interior, protected side of the glass, that would penetrate a thin sheet of aluminum foil 6 inches away.
- Side window glazing must survive impact by the same projectile at a lower velocity of 12 feet per second (8 mph).

The new rules also require manufacturers to certify compliance with all requirements. They are now included in FRA Regulations 49 CFR Part 223.

These requirements became effective on Dec. 31, 1979, at a time when most 1980 budgets were already committed; so far most railroads have been slow in complying with the new standards. Since June 1980, they have been required to replace broken windows with glazing material that meets the specifications; they will be required to replace all windshields and windows not in compliance by June 30, 1983. This deadline applies to all common carriers, including Amtrak, and to commuter operations carried over common carrier lines in whole or in part. BART, PATH, and the New York and Chicago subway systems will be exempt, since none of their tracks are common-carrier operated.

Glazing manufacturers have been busy putting their products through the required testing and certification procedures, hoping to get a share of the major orders that some expect to be placed in the first and second quarters of 1981. Some of the principal manufacturers and their products are shown in the accompanying table.

Manufacturer	Trade names	Product description
Chromalloy Safetee Glass Division	HRV Railglas	Double ply, one of strengthened glass and one of thin float glass, laminated with polyvinyl butyral.
Ellcon-National	Triplex Safety Glass	Outside and interior layers of thermally toughened glass laminated with a core of polyvinyl butyral.
General Electric Co.	Lexgard	Two plies of Lexan polycarbonate sheet bonded together with an interlayer.
	Margard	One and two plied of Lexan Polycarbonate with abrasion resistant coating.
Globe Amerada Glass Co.	CRG - Certified Railroad Glazing	Multiple layers of chemically strengthened thin float glass laminated with interlayer of polyvinyl butyral.
PPG Industries Inc.	Railway Glazing	Outside heat strengthened glass laminatedwith interlayer and inside spall shield. Some with heating film and third ply of glass.
Rohm & Haas	Tuffak CM-2	Abrasion-resistant polycarbonate sheet. Single ply or double ply with eighth or quarter-inch air space.

Market

CARLOADINGS

Loadings of revenue freight in the week ended Dec. 6 totaled 447,882 cars, according to the Association of American Railroads. This was a decrease of 24,213 cars, or 5.1%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Dec. 6 are estimated at 18.7 billion, a decrease of 1.6% below the corresponding week of 1979.

REVENUE FREIGHT CARLOADINGS

Commodity	Dec. 6 week	Nov. 29 week	Nov. 22 week
Grain	32,666	23,140	33,092
Farm products	6,288	5,506	5,517
Metallic ores	32,956	25,973	29,555
Coal	113,862	99,874	122,360
Crushed stone, gravel & sand	12,383	10,238	13,502
Nonmetallic minerals	13,344	10,984	13,198
Grain mill products	16,538	14,120	16,920
Food and kindred products	16,873	14,392	18,531
Primary forest products	20,108	14,675	19,826
Lumber & wood products (except furniture)	8,169	7,718	9,459
Pulp, paper & allied products	20,780	19,075	20,247
Chemicals & allied products	29,401	25,183	27,488
Petroleum products	5,798	4,807	5,731
Stone, clay & glass products	15,310	12,398	15,401
Coke	5,924	5,561	5,950
Metals & products	16,327	14,901	16,463
Motor vehicles & equipment	18,610	14,775	19,161
Waste & scrap materials	12,679	10,699	13,548
Forwarder & shipping assn. traffic	9,832	8,522	11,172
All other carloads	39,725	33,143	42,639
LCL traffic	249	224	241
Total cars loaded	**447,822**	**375,908**	**460,001**

	1980	1979
Cumulative total 49 weeks	**21,407,164**	**22,643,012**
Estimated revenue ton-miles (billions), 49 weeks	**865.0**	**864.3**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the holiday week ended Nov. 29 totaled 26,715 cars (24.5% below the corresponding non-holiday week of 1979) and 47,746 trailers or containers (down 23.0% from 1979). Cumulative volume for the first 48 weeks of 1980 is 1,540,508 cars (down 10.7% from 1979) and 2,797,314 trailers or containers (down 8.1% from 1979).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Nov. 7 totaled 5.0 million tons (down 2.3% from 1979). Cars loaded totaled 74,584 (down 3.4% from 1979). Cumulative loadings for 1980 were up to 225.98 million tons (up 0.4% from 1979).

- *Boston & Maine.*—Purchased 100 100-ton, 3,000-cubic-foot-capacity covered hopper cars from Portec's Railcar Division. The twin-compartment cars will be used primarily for hauling sand and cement.

- *Chicago & North Western.*—Is acquiring 2,700 jumbo covered hopper cars: 1,000 under optional five-year lease from North American Car and 1,700 under 20-year lease from Pullman Standard, at total cost of more than $100 million. Builders for NA jumbos are Berwick and Ingalls Shipbuilding (500 each), for December 1980-March 1981 delivery. PS will build its cars at Butler, Pa., for March-June delivery.

- *City of Philadelphia.*—General Railway Signal is the apparent low bidder on a $6.9-million project to signal the new eight-mile rapid transit line to the Philadelphia airport. Under the bid, GRS would supply and supervise the installation of switch machines, color light signals, wired electronic instrument housings, and a dispatcher's control machine.

- *Freight cars and locomotives.*—The following report has been received from the AAR and the ARCI:

DELIVERED

	October		September	Ten months	
	1980	1979	1980	1980	1979
Built new by carbuilders	6,956	7,758	6,596	70,712	68,513
Built new in RR shops	412	349	351	4,813	4,469
Built new—total	7,368	8,107	6,947	75,525	72,982
Rebuilt	21	96	199	1,143	812
TOTAL DELIVERED	**7,389**	**8,203**	**7,146**	**76,668**	**73,794**
Locomotives (new and rebuilt)	101	183	80	1,489	1,564

ORDERED

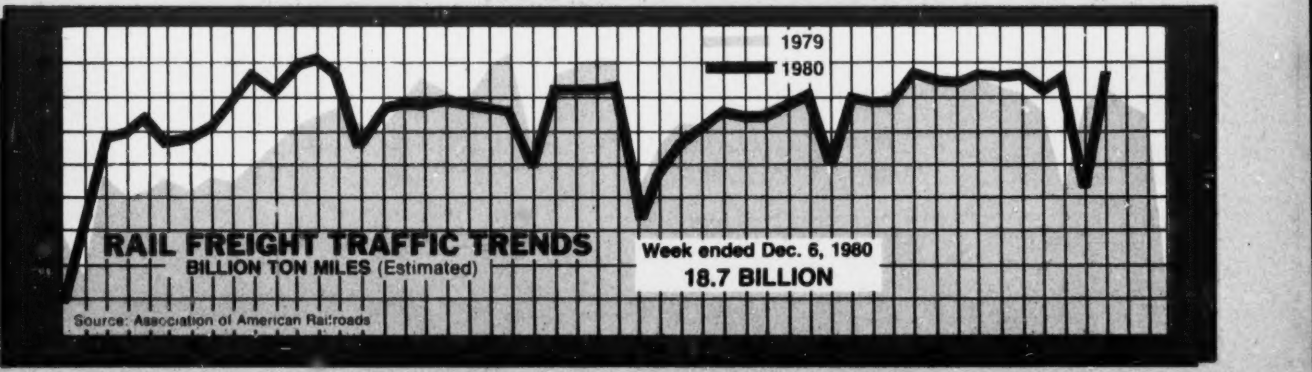
	October 1980	October 1979	September 1980	Ten months 1980	Ten months 1979
To be built new by carbuilders	1,847	6,129	4,406	33,058	99,777
To be built new in RR shops	200	0	0	4,550	4,463
To be built new—total	2,047	6,129	4,406	37,608	104,240
To be rebuilt	0	95	0	1,063	825
TOTAL ORDERED	**2,047**	**6,224**	**4,406**	**38,671**	**105,065**

ON ORDER AND UNDELIVERED

	November 1		October 1	Average backlog	
	1980	1979	1980	1980	1979
To be built new by carbuilders	53,389	117,422	59,806	78,923	113,746
To be built new in RR shops	5,989	6,305	6,201*	6,491	6,359
To be built new—total	59,378	123,727	66,007*	85,414	120,105
To be reuilt	20	100	41	290	103
TOTAL ON ORDER	**59,398****	**123,827**	**66,048***	**85,704**	**120,208**
Locomotives (new and rebuilt)	496	774	595	870	1,000

* Revised figures

**Due to revisions and cancellations of some orders, the backlog has been reduced by 1,308 cars



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Transit car procurement: Breakthrough in Buffalo

January 12, 1981

RAILWAY AGE

Commuter crisis in the northeast

RAILWAY AGE

USPS 449-130

January 12, 1981 • Vol. 182, No. 1

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Published semi-monthly by the Simmons-Boardman Publishing Corporation, 508 Birch St., Bristol, Conn. 06010. Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $10 one year, $16 two years; all other countries $25 one year. All other subsubscribers in the U.S., Canada, and Mexico: $20 one year; all other countries: $35 one year. All subscriptions payable in advance. Single copies $1 plus postage and handling, except special issues. Copyrighted © 1980.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.
Change of address should reach us three weeks in advance of next issue date. Send old address with new enclosing, if possible, your address label. Post Office will not forward copies unless you provide extra postage.

Member of

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Controlled circulation postage paid at East Stroudsburg, PA., and at Bristol, CT.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010

Inside

LUTHER S. MILLER

THE YEAR OF REAGAN

Mrs. Nancy Reagan is reputed to be a wise and well-informed woman who exercises considerable influence over the President-elect. When Mrs. Reagan talks, people listen. A Chicago reporter was listening when Mrs. Reagan was asked, during the campaign, what she thought of Tennessee Tombigbee. "I don't know Mr. Bigbee," she replied. Well, nobody knows everything.

Now that they are on their way to the White House, the Reagans presumably know more about a lot of things than they knew before. The President-elect appointed a number of task forces to delve into policy issues and come up with recommendations for the new administration. The transportation task force was headed by former DOT Secretary Claude S. Brinegar. Mr. Brinegar, a California oilman, did not distinguish himself as a friend of public transportation during his short stay at the DOT; the recommendations of his task force do nothing to tarnish that reputation. They call for, among other things, the dismemberment of Conrail; amputation of most money-losing Amtrak routes; and deep cuts in federal spending for public transit.

There is, to be sure, much fat in current federal programs for transportation, and expert surgery is called for. Railroad and transit people can only hope that the new conservatives in Washington do not become so excited in their pursuit of spending cuts that they forget that there's a difference between surgery and butchery.

Nobody knows, of course, what Mr. Reagan will do about transportation or anything else. What we do know is that he is not a man who is easily stampeded, either to the right or the left. We also know his choice for Transportation Secretary, and it appears to be an uncommonly wise one. Andrew L. (Drew) Lewis, Jr., will bring to the DOT more experience in transportation than any other man who has held that office. A management consultant who, according to the *Philadelphia Inquirer*, "specializes in rescuing financially ailing businesses," Mr. Lewis has served as a trustee of the Reading Railroad and its successor, the Reading Co., since 1971. He once said he learned all he knew about railroading from the late Charlie Bertrand, president of the Reading. He could not have had a better teacher. And in our opinion, the U.S. DOT—one of Washington's perennially "financially ailing businesses"—could not have a better man in charge during a time when so many difficult policy decisions must be made.

Franklyn K. Lauden, 1919-1980

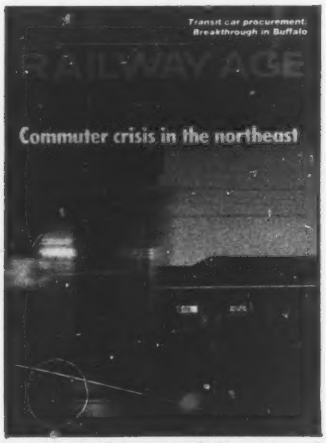
Franklyn K. Lauden, managing editor of *Railway Age*, died of a heart attack Dec. 16 at his home in Bronxville, N.Y. He was 61 years old.

While Frank's byline rarely appeared in *Railway Age*, each issue carried the stamp of his meticulous craftsmanship. His job was to guide manuscripts on their journey to the printed page; he did so with consummate skill, exorcising many a solecism and straightening many a wobbly sentence along the way.

Born in Cleveland, Ohio, Jan. 8, 1919, Frank was graduated from the University of Ohio with a B.S. degree in journalism in 1940. He worked as a reporter for the Cleveland Plain Dealer, as assistant editor of *Science Illustrated*, and as chief editor of *Nature & Science* before joining Simmons-Boardman in 1974 as an associate editor of *Banking* (now *ABA Banking Journal*). He came to work for *Railway Age* the following year.

RAILWAY AGE

January 12, 1981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Passenger trains may be in for a bumpy ride as a new, economy-minded administration comes to power. Amtrak is likely to feel the pinch first: Transit funding is safe through fiscal '81; after that, the outlook is cloudy.

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Conrail may soon have to unload its commuter business, and the city and state agencies that now have contracts with the railroad are scurrying around for a successor. Amtrak is a likely though not entirely satisfactory answer.

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Instead of delivering a rigid set of specifications to builders, Buffalo issued broad criteria and then let the builders do the specs. As a result, the price bids came in within a comparatively narrow range.

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COVER: New York-bound commuters at Princeton Junction, N.J. Photo by Roy Blanchard.

Moving people

Big cuts in federal funding?

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957
Amtrak

Amtrak faces the fight of its life as a hostile administration comes to power.

Passenger-train advocates greeted the new year with a bad case of the Reagan jitters. The new administration is committed to domestic-program spending cuts—and for starters, a transportation task force, headed by former DOT Secretary Claude Brinegar, has recommended deep cuts in the federal aid that has helped keep intercity, commuter, and transit trains running.

Amtrak had the dubious distinction of being first on the list of cuts drawn up by the people advising President-elect Reagan on transportation. It was going to be a crucial year for Amtrak anyway, what with the need for new funding authority and a decision on developing new corridors; the arrival of a fairly hostile administration and the departure of some key friends in Congress may turn 1981 into the fight of Amtrak's political life.

● **An enemy at OMB?** Amtrak's plight is exemplified by the appointment of David Stockman as head of the Office of Management and Budget, where he will hold a knife over Amtrak's budget through the Department of Transportation. The Detroit-Chicago Amtrak route runs through the district that Stockman served in Congress until his appointment. Last year Rep. Stockman was the only affected member of the Michigan delegation to Congress who refused to sign a letter endorsing that route as an emerging corridor.

Some Amtrak routes are probably doomed anyway. In 1979 Congress gave these routes one last chance, with Sept. 30, 1981, the deadline for meeting certain performance criteria: long distance trains had to achieve at least 150 passenger miles per train mile and not run up an avoidable loss of more than seven cents per passenger mile. Three trains are thereby endangered: the InterAmerican (Chicago-Texas), the Pioneer (Salt Lake City-Seattle), and the Cardinal (Washington-Chicago).

Route changes on those three are being studied in an effort to save them. On other long-haul routes, the introduction of Superliner equipment has resulted in healthy ridership increases. A case in point is the Empire Builder, which carried 140 pm/tm and lost ten cents per pm a year ago. Now it's carrying 212 pm/tm and has cut its loss to four cents per pm.

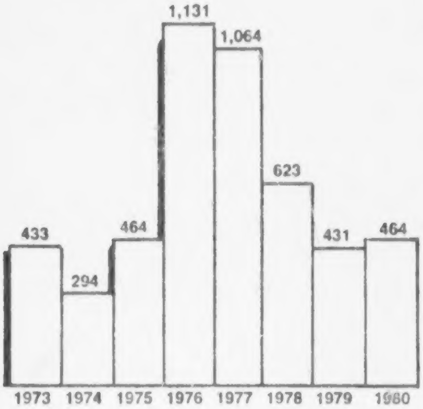
But the rules of the game may be changed again in the new Congress. Ironically, the new pressure from without comes at a time of growing optimism within, where President Alan S. Boyd has worked particularly to assure equipment manufacturers of a long-term demand for new cars.

● **Equipment funds needed.** Amtrak has finally been getting its equipment lined up. The last of the old steam cars left Chicago in December 1980, replaced by refurbished head-end-power cars. The steam cars are now mostly second-stringers. Superliners will continue arriving until 1982, and an order of 150 Amfleet-2 cars for use on long-distance trains should begin to arrive from Budd in August 1981. And this year Amtrak wants to order the first 200 of what could eventually be an order of 1,000 cars of a new design, the "next generation" of low level cars. In 1979 Congress granted Amtrak several years of capital authorization to provide manufacturers with assured business levels; Amtrak says it needs another multiple-year authorization now.

Congress is scheduled to take up another passenger train bill in 1981, deciding whether to develop short-distance corridors outside the Northeast Corridor. Though the initial ranking of "emerging corridor" prospects stirred considerable disagreement among state agencies eager to see funding for their own routes, those states may now be forced to lower their expectations. On the other hand, if the Reagan administration or Congress make wholesale cuts in long-distance service, the case might be strengthened for funding improvements over short-distance

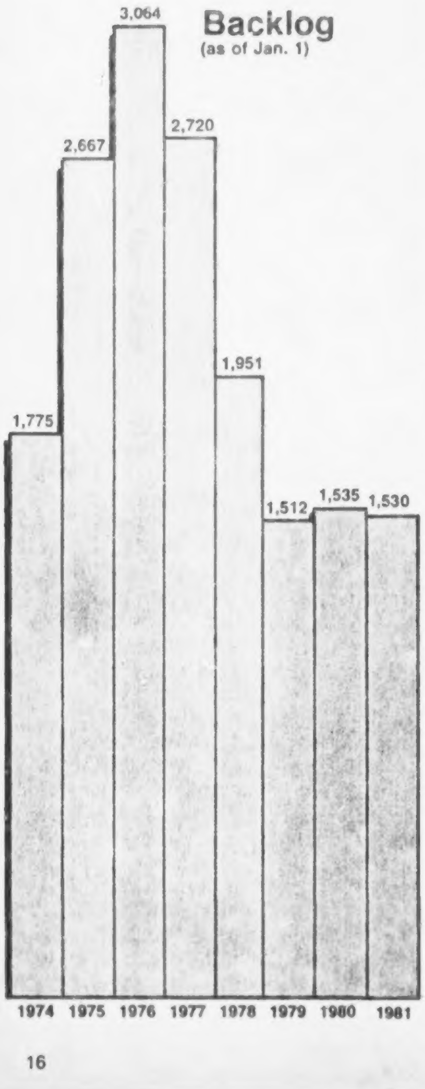
Passenger car market at a glance

Deliveries



Backlog

(as of Jan. 1)



These cars were delivered in 1980:

Purchaser	No. of Cars	Type	Builder
Amtrak	134	Intercity	Pullman Standard
Atlanta (MARTA)	38	Rapid Transit	Societe Franco-Belge
Boston (MBTA)	47	Rapid Transit	Hawker-Siddeley
	7	Commuter	Pullman Standard
Calgary	27	Light Rail	Siemens-DuWag
Chicago (RTA)	55	Commuter	Budd
Connecticut (CDOT)	13	Commuter (self-propelled)	Budd
Edmonton	3	Light Rail	Siemens-DuWag
Philadelphia-Camden (PATCO)	42	Rapid Transit	Canadian Vickers
Philadelphia (SEPTA)	2	Light Rail (prototype)	Nissho-Iwai (Kawasaki)
San Diego (MTDB)	14	Light Rail	Siemens-DuWag
San Francisco (Muni)	30	Light Rail	Boeing Vertol
Toronto (TTC)	52	Light Rail	Hawker-Siddeley
Total	464		

Work goes forward on this undelivered backlog:

Purchaser	No. of Cars	Type	Builder
Amtrak	150	Intercity	Budd
	83	Intercity	Pullman Standard
Atlanta (MARTA)	34	Rapid Transit	Societe Franco-Belge
Baltimore (MdMTA)	72	Rapid Transit	Budd
Buffalo (NFTA)	33	Light Rail	Tokyu Car
Chicago (CTA)	300	Rapid Transit	Budd
Chicago-Northern Indiana (RTA-NITA-CSS&SB)	36	Commuter (self-propelled)	Sumitomo
Cleveland (GCRTA)	48	Light Rail	Breda
Miami-Dade County (MDCTA)	136	Rapid Transit	Budd
New Jersey (NJDOT)	117	Commuter	Bombardier
Philadelphia-Camden (PATCO)	4	Rapid Transit	Canadian Vickers
Philadelphia (SEPTA)	139	Light Rail	Nissho-Iwai (Kawasaki)
	125	Rapid Transit	Nissho-Iwai (Kawasaki)
Pittsburgh (PAT)	10	Commuter-rebuilt	General Electric
San Diego (MTDB)	10	Light Rail	Siemens-DuWag
Toronto (TTC)	89	Light Rail	Hawker-Siddeley
Via Rail Canada	50	Intercity	Bombardier
Washington (WMATA)	94	Rapid Transit	Breda
Total	1,530		

These orders are likely to develop in 1981:

Purchaser	No. of Cars	Type
Amtrak	19	M-u
Atlanta (MARTA)	30-50	Rapid Transit
Baltimore MdMTA)	28	Rapid Transit
Boston (MBTA)	50-100	Light Rail
Chicago (CTA)	300	Rapid Transit
Cleveland (GCRTA)	60	Rapid Transit
Detroit (SEMTA)	7	Commuter-rebuilt
Edmonton	20	Light Rail
New York (MTA-Conrail)	60	Commuter
New York (MTA-LIRR)	70	Commuter
Pittsburgh (PAT)	55	Light Rail
San Francisco (BART)	90	Rapid Transit
Total	789-859	

The five year (1982-1987) outlook:

Purchaser	No. of Cars	Type
Amtrak	0-100	Intercity
Atlanta (MARTA)	110-130	Rapid Transit
Boston (MBTA)	32-93	Commuter (converted RDC's)
Calgary	30-60	Light Rail
Chicago (RTA)	76-151	Commuter
Detroit (SEMTA)	25-40	Commuter
Edmonton	0-40	Light Rail
Honolulu	200	Rapid Transit
Los Angeles (SCRTD)	120-132	Rapid Transit
Montreal (MUCTC)	0-100	Rapid Transit/Commuter
New Jersey (NJDOT)	50-60	Commuter (self-propelled)
New York (MTA-NYCTA)	1200	Rapid Transit
New York (MTA-Conrail)	0-72	Commuter
New York (MTA-LIRR)	0-150	Commuter
Philadelphia (SEPTA)	0-96	Light Rail
	0-70	Commuter
Pittsburgh (PAT)	55	Light Rail
San Diego (MTDB)	15-20	Light Rail
San Francisco (BART)	90-155	Rapid Transit
San Francisco (Muni)	25-100	Trolley
	15	Light Rail
San Juan Transit	100	Rapid Transit
Toronto (TTC)	103-121	Light Rail
Toronto (GO Transit)	70	Commuter
Washington (WMATA)	350	Rapid Transit
Total	2,666-3,680	

corridors with good ridership potential. Amtrak itself has gone from state to state drumming up support for the corridors, but expects to take a low profile during the debate in Congress.

All these issues—the emerging corridors, future capital funding, the fate of the long-distance trains—may be joined together with Amtrak's request for operating funds for fy 1982 and 1983. In the meantime Amtrak will need supplemental funding to get through 1981. A $72.5 million supplemental appropriation (less than the $90.0 million Amtrak requested) nearly passed Congress in December but disappeared when the last-minute "Christmas tree" funding bill was shorn of most of its ornaments.

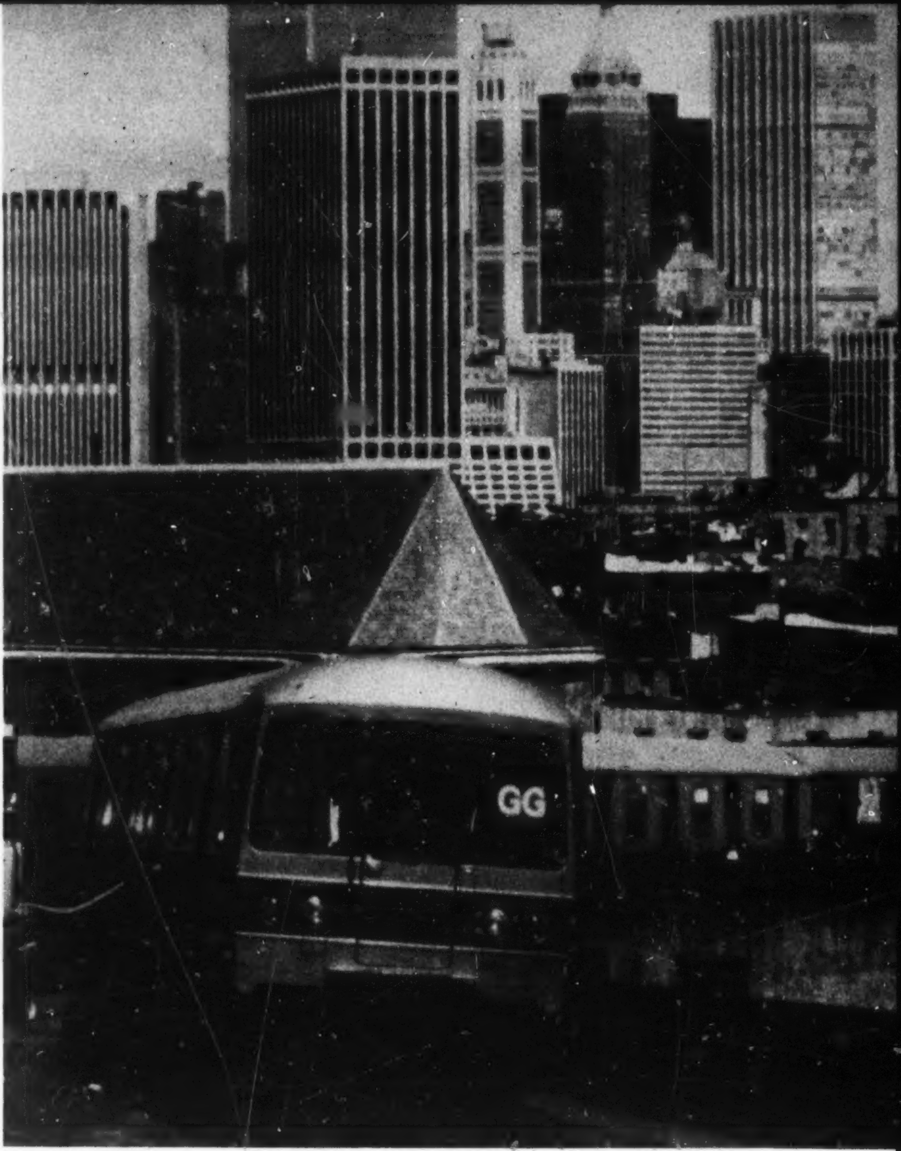
Congress and the DOT will attract most of Amtrak's attention in 1981 but the railroads will get some, too, as operating contracts are renewed. In exchange for a higher incentive payment potential, Amtrak wants to be able to measure on-time performance at intermediate stops along the route, not just at the end point. Amtrak says too many railroads have put all the scheduling slack at the end of a route, allowing trains to run late all the way and still arrive "on-time" under the existing contract's definition

- **Washington in transit.** The transit funding picture is similarly clouded by the new conservatism.

A variety of complex side issues—handicapped access, Buy America requirements, a new subsidy distribution formula—was finally resolved late in 1980 after more than a year of debate. In the end it was simply the big dollar figure, including the add-on from the windfall profits tax on oil, that spelled doom for 1980's five-year authorization bill for mass transit.

Calling the $25.5 billion bill a last-gasp attempt by Democrats to raid the treasury, conservative Republicans kept the bill from the floor of a friendly Senate and brought an end to the campaign that began in 1979 when President Carter called for a $50 billion commitment of federal and local funds to mass transit over the next ten years.

Transit advocates adopted the tone of the new Washington as they picked up the pieces and prepared to start over with the new Congress. "I think it was simply a feeling that the new administration should be able to put its stamp on the legislation," said Jack Gilstrap, executive vice president of the American Public Transit Association. "There's a high priority here in Washington on reducing federal expenditures, for good reason. But I think there's a very keen awareness in the business community of the importance of mass transit to urban areas. Even as business-oriented and conservative as the new administration may be, it's aware that transit cannot be one of those services cut back if we're going to build jobs for our economy."


Transit funding for fiscal 1981 is substantial and safe—but lean years may lie ahead.

While the rhetoric may henceforth emphasize economic rather than social benefits, the bill that comes before the new Congress will no doubt contain many of the laboriously developed compromises that were in the final 1980 bill. But the eventual commitment of federal funds to mass transit may not be as great, now that it will be hard to make even rhetorical use of the windfall profits tax, which is generally frowned upon by conservatives.

In addition to boosting transit spending by 75%, the final 1980 bill had retained the 50% American-built requirement for transit equipment purchased under the Buy America provision, but raised from 10% to 15% the add-on penalty for foreign bids. It allowed cities to substitute local options for the controversial federal access requirements for handicapped persons. Some funds were guaranteed through 1990 to allow long-range planning for construction of rail transit systems. Operating assistance would have been funded on the basis of revenue-vehicle miles, though the final compromise offered a year of transition from the old population-based formula.

"I think the new formula will go," said Gilstrap, again echoing conservative themes. "It puts the money where service is provided, it emphasizes local responsibility and accountability, and encourages efforts to improve productivity."

In the meantime, funding for fiscal 1981 is safe. It is even substantial. On top of the authorization provided through 1982 by the Surface Transportation Act of 1978, Congress appropriated additional funds for this year in anticipation of passage of the five-year bill. Now the five-year bill is dead but the one-year boost lives on, with a $2.19 billion Section 3 for capital grants, up from $1.38 billion in 1980.

That may be the only windfall profits tax money that the transit industry ever sees. ■

Market

CARLOADINGS

Loadings of revenue freight in the week ended Dec. 20, 1980, totaled 444,258 cars, according to the Association of American Railroads. This was a decrease of 15,288 cars, or 3.3%, compared with the corresponding week of 1979. Ton-miles generated by carloadings in the week ended Dec. 20 are estimated at 18.4 billion, a decrease of 0.6% below the corresponding week of 1979.

REVENUE FREIGHT CARLOADINGS

Commodity	**Dec. 20 week**	**Dec. 13 week**
Grain	31,170	28,423
Farm products	5,303	6,160
Metallic ores	30,037	34,355
Coal	121,733	123,075
Crushed stone, gravel & sand	10,119	11,947
Nonmetallic minerals	12,968	14,280
Grain mill products	16,562	17,010
Food and kindred products	16,031	17,092
Primary forest products	19,254	19,920
Lumber & wood products (except furniture)	8,978	8,968
Pulp, paper & allied products	20,440	20,811
Chemicals & allied products	29,269	29,939
Petroleum products	5,501	5,757
Stone, clay & glass products	13,654	15,058
Coke	5,623	5,569
Metals & products	15,409	15,870
Motor vehicles & equipment	15,057	20,241
Waste & scrap materials	13,639	14,073
Forwarder & shipping assn. traffic	10,723	10,762
All other carloads	42,530	42,237
LCL traffic	258	311
Total cars loaded	**444,258**	**461,758**
Cumulative total,	1980	1979
51 weeks	**22,312,007**	**23,585,656**
Estimated revenue ton-miles		
(Billions), 51 weeks	**902.5**	**901.5**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Dec. 13, 1980, totaled 33,944 cars (8.1% below the corresponding 1979 week) and 61,391 trailers or containers (down 7.2% from 1979). Cumulative volume for the first 50 weeks of 1980 is 1,605,441 cars (down 10.8% from 1979) and 2,914,759 trailers or containers (down 8.2% from 1979).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the nine-day period ended Nov. 30, 1980, totaled 5.8 million tons (down 17.5 from 1979). Cars loaded totaled 85,914 (down 16.5% from 1979). Cumulative loadings for 1980 were up to 3.5 million tons (down 2.3% from 1979).

- *Norfolk & Western.*—NW's $131.1-million capital budget for 1981 (which is down from $148.7 million in 1980) includes the following major items: Purchase of six new six-axle, 3,600-hp diesel-electric units for $5.4 million; construction of 347 gondola cars in the Roanoke shops at a cost of $11.9 million, followed by construction of 853 open-top hoppers costing $29.6 million; upgrading of NW's 66-mile line between Muncie and Fort Wayne, Ind.; construction of a new yard and related facilities at Wentzville, Mo., where General Motors is building a new assembly plant; modernization of the steam plant in the Roanoke shops; preliminary design work for a new locomotive maintenance facility at Roanoke. NW's 1981 m/w program includes installation of 343 miles of welded rail and installation of 900,000 crossties.

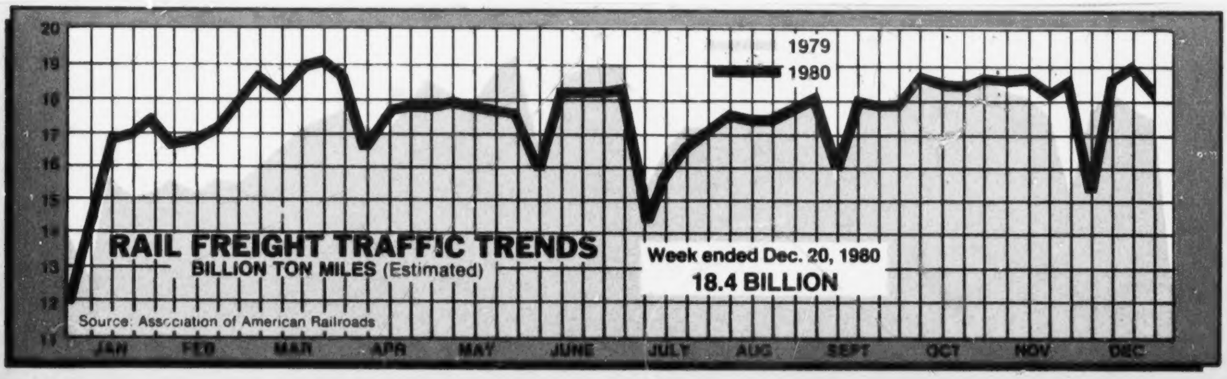
- *SCL Industries.*—Capital expenditures in 1981 will be in the range of $400 million, down from an estimated $473 million in 1980. A detailed program for 1981 has not been announced. In 1980, major acquisitions were 173 new and rebuilt locomotives and 7,300 new and rebuilt freight cars.

- *Soo Line.*—Equipment program for 1981 includes 10 locomotives and 245 freight cars, to be acquired at an estimated cost of $18.7 million. In 1980, Soo spent $30 million for 20 locomotives and 624 freight cars.

- *Kowloon Canton Railway (Hong Kong).*—Awarded an $8-million contract to Cubic Corp. for a computerized automatic revenue collection system. Cubic is to produce 100 gates, 70 ticket vending machines, 60 ticket office machines, and management computers for the railway, which runs from Kowloon to the border of China, 20 miles. Cubic earlier won a $38-million contract to develop a fare collection system for the new Hong Kong rapid transit system.

- *Lithcote Co.*—A $1-million expansion program now under way will double the lining capabilities of Lithcote's car lining and repair shop at Muscatine, Iowa. The expanded shop, says Dennis Kircher, vice president and general manager of Lithcote, will be able to line 1,400 cars a year.

- *National Railways of Mexico.*—Will use proceeds of a $150-million World Bank loan to help finance a $1.5-billion 1981-1983 rehabilitation program. The loan will be used toward procurement of 90,000 tons of rail, 504 new freight cars, 7,000 sets of freight-car components, 8,000 sets of axles and roller bearings, and technical consulting services.



RAIL FREIGHT TRAFFIC TRENDS
BILLION TON MILES (Estimated)

Week ended Dec. 20, 1980
18.4 BILLION

Source: Association of American Railroads

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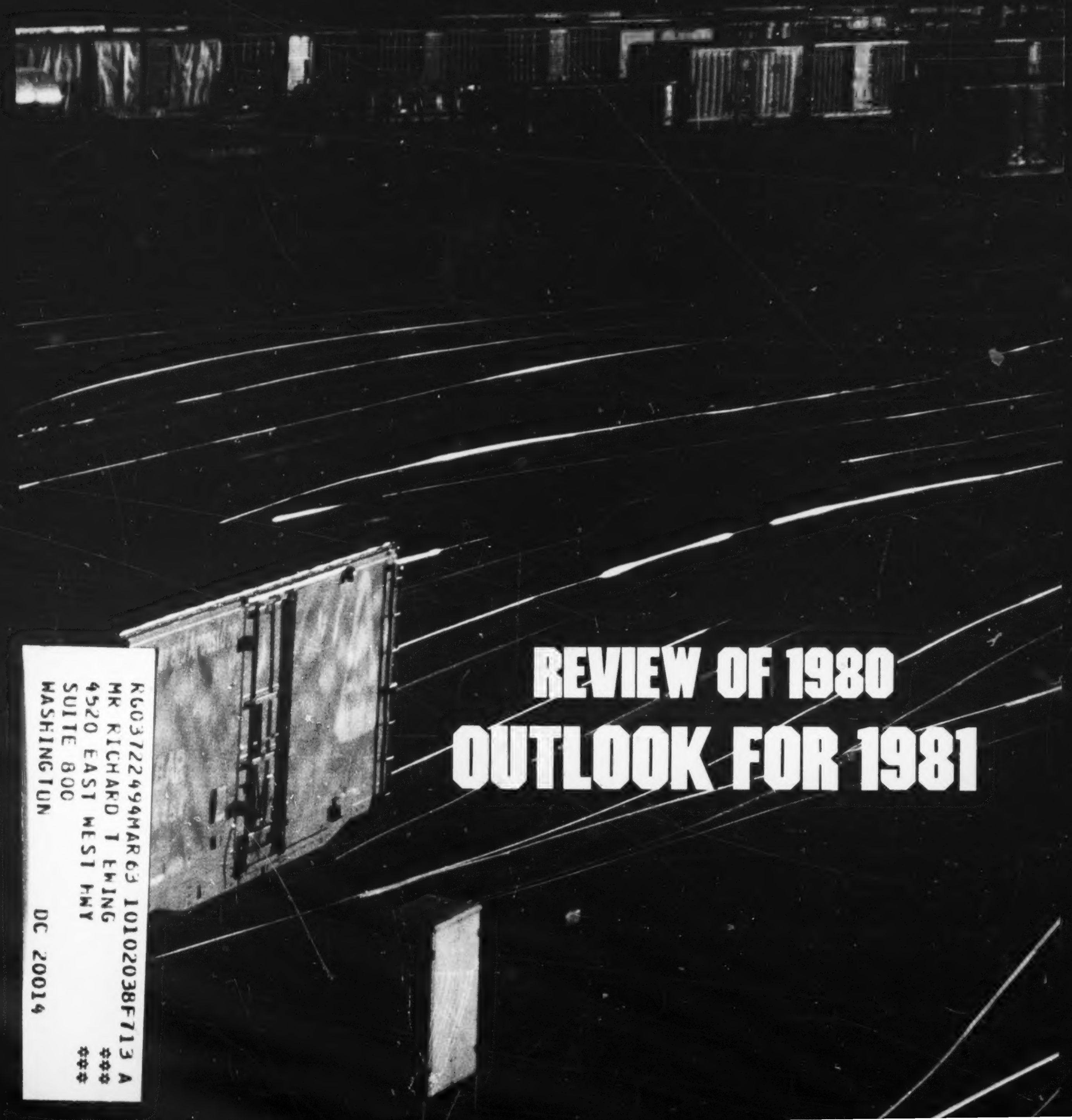
SPECIAL REPORT

January 26, 1981

RAILWAY AGE



REVIEW OF 1980
OUTLOOK FOR 1981

RG03722494MAR63 10102038F713 A
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USPS 449-130

January 26, 1981 • Vol. 182, No. 2

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Published semi-monthly by the Simmons-Boardman Publishing Corporation, 508 Birch St., Bristol, Conn. 06010. Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $10 one year, $16 two years; all other countries $25 one year. All other subsubscribers in the U.S., Canada, and Mexico: $20 one year; all other countries: $35 one year. All subscriptions payable in advance. Single copies $1 plus postage and handling, except special issues. Copyrighted © 1980.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.
Change of address should reach us three weeks in advance of next issue date. Send old address with new enclosing, if possible, your address label. Post Office will not forward copies unless you provide extra postage.

Member of

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Controlled circulation postage paid at East Stroudsburg, PA., and at Bristol, CT.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010

Inside

LUTHER S. MILLER

VIEWS AND REVIEWS

This is Review & Outlook time for the editors of *Railway Age*, and as always, we approach the reviewing stand with considerably more confidence than we don our forecasting caps.

Last year the railroads and their suppliers fared uncommonly well, considering that for much of the year the economy was in recession. While total carloadings dropped around 5.4%, ton-miles were actually up slightly due to the brisk business that was experienced in coal and grain traffic, both heavy-loading, long-haul commodities. Due to timely rate increases and effective cost-control measures, revenues rose faster than expenses.

For suppliers, it was one of the best years in recent history, with close to 90,000 new freight cars and around 1,700 new and rebuilt locomotives delivered.

But the best news of 1980 was churned out not by the computers, but by Congress, which through passage of the Staggers Rail Act gave the railroads much of the regulatory freedom they have been clamoring for since memory of man goeth back not to the contrary.

The new year is, of course, another story, and it is one that we are not prepared to write quite yet, though it may be said that the railroads are better prepared to ride out stormy weather than they have been for many years. For suppliers, 1981 won't be the best year of the last 10 but it won't be the worst either. With order backlogs down, they will produce only slightly more than half as many new cars and locomotives as they produced in 1980; but half of last year's production levels will be better than those of some years in the not distant past. Nearly all suppliers see an upturn in new orders starting in the third or fourth quarters.

Our series of outlook articles begins on p. 22; our review starts on p. 57.

CHINA, ANYONE?

Railway Age, which together with its companion publications, *Railway Track & Structures* and *International Railway Journal*, will publish a Chinese language edition in April, is exploring further ventures in cooperation with the Chinese Railway Ministry. One proposal that has been advanced is a technical/professional tour of major sectors of China's 30,000-mile rail network. It would probably be a 15-day tour, starting from Hong Kong and ending in Beijing (Peking). Included would be a journey, by private first class train, over the recently-completed, 652-mile Chengdu-Kunming line, which penetrates the "forbidden zone" in Sichuan and Yunnan provinces. There would be visits to shops (including one where modern steam locomotives are still under construction) and principal yards. All travel within China would be by train, with the itinerary chosen to emphasize points of interest to all railway disciplines.

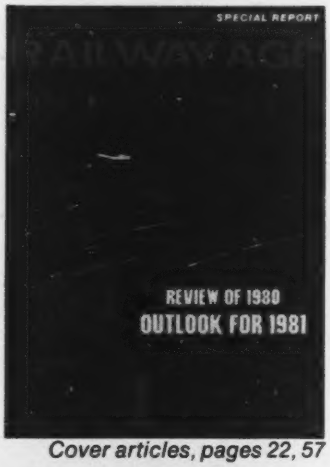
If there is sufficient interest in such a tour, it would probably be scheduled for mid-October 1981, when weather conditions are most favorable throughout the People's Republic. Interested persons should get in touch with *Railway Age* Publisher Robert G. Lewis in our New York office.

SAFETY GLASS: ADD SIERRACIN

Due to a printer's error, Serracin-TransTech was inadvertently omitted from a list of manufacturers supplying safety glazing materials to railroads (*RA*, Dec. 29, 1980, p. 56). Sierracin offers 11 different glazing products, featuring outside layers of strengthened glaze with interlayers of varying material and thickness for specific applications.

RAILWAY AGE

January 26, 1981



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Cover: Conrail's Allentown, Pa., yard, photographed at sunset by Roy H. Blanchard.

M/W: A change of heart in the executive suite?

By MERWIN H. DICK
Consulting Editor

No one can be sure at this point but a fundamental change may have taken place in the attitude of some railroad managements toward maintenance of way. A chief engineer put his finger on the change when he said m/w expenditures on his road were being geared these days more closely to the needs of the property.

Another indication can be found in answers given by a group of chief engineers to the question: Are the materials and labor going into your tracks today adequate to maintain them at an acceptable level considering the traffic load being carried? Without hesitation they all answered "yes." The affirmative answer is all the more significant since the question and the answers came near the close of a recession year.

Most chief engineers are not about to buy the thought, however, that there has been a change in management thinking, even following a recession year during which m/w programs, measured by rail and tie renewals and track surfacing, were maintained at relatively high levels—nor even as they look forward to another recession year during which m/w programs as a whole will be moving even higher, according to present plans.

If chief engineers remain unconvinced, who can blame them for harboring a degree of skepticism? Have they not had many disappointments in the past when they watched as management cut to shreds what they considered necessary programs of track maintenance? Perhaps, following several successive years during which they are allowed by management to proceed with adequate programs in the face of substantial declines in business, they might begin to believe that there has indeed been a change of heart in the executive suite.

- **Reasons for pausing.** Certainly managements have good reason to pause before yielding to the temptation to slash m/w appropriations at the first sign of a business decline. The effects of two decades of undermaintenance during the '50s and '60s must still be fresh in mind. The jump in costly derailments is one. Imposition of the FRA Track Safety Standards is another. The ensuing enormous cost of rehabilitating rundown trackage is a third.

Was it recollections of this scenario that caused some managements to resist the urge to cut m/w expenditures during the recession year of 1980 and to approve m/w budgets for 1981 which are actually higher than the year before?

Not necessarily. Several factors were at work suggesting the time for m/w cuts had not yet come even though the economy was in recession. There were two such factors:

—Railroad business was not hurting nearly as badly as some other sectors of the economy, such as housing, steel and automobiles. A major reason is that loss of traffic in these and other sectors was being offset somewhat by strength in loadings of coal and grain.

—The types of traffic that are holding up best are mostly carried in 100-ton cars operated in unit trains, which exert more wear and tear on the track, especially rail, than conventional types of traffic, thus presenting a sound argument for holding m/w programs at a relatively high level.

So it could have been these and possibly other factors that are causing chief engineers to urge greater, rather than less, m/w spending during a recession period, and managements to accept their line of reasoning.

- **Trend: Steady to upward.** Thus it is that both rail and tie renewals were being maintained in 1980 at about the same high levels that prevailed in the mid-'70s, with tie renewals even registering a slight gain over 1979, although rail insertions showed a moderate loss. Even more significant, both rail and tie renewals are expected to show solid gains in 1981. So is the mileage of track surfaced. Ever since *Railway Age* started compiling figures a decade ago on the mileage of track surfaced this figure has gained in every year and is expected to show another increase in 1981.

Projections of m/w work for both 1980 and 1981 are based on figures furnished by nearly all the Class I railroads.

The Class I railroads as a whole, it is estimated, laid a total of 875,000 net tons of new rail in replacement in 1980. This was a reduction of 136,000 tons, or 13.4%, compared with 1979. Even so it was the largest amount of new replacement rail to be laid in any year in the last decade with the exception of 1977 and 1979, the 1,011,000 tons laid in 1979 being the largest.

Tie renewals last year were in a counter trend to rail insertions. It is estimated that Class I railroads as a whole inserted 25.7 million new ties in replacement last year. This was an increase of 651,226 ties, or 2.6%, compared with 1979.

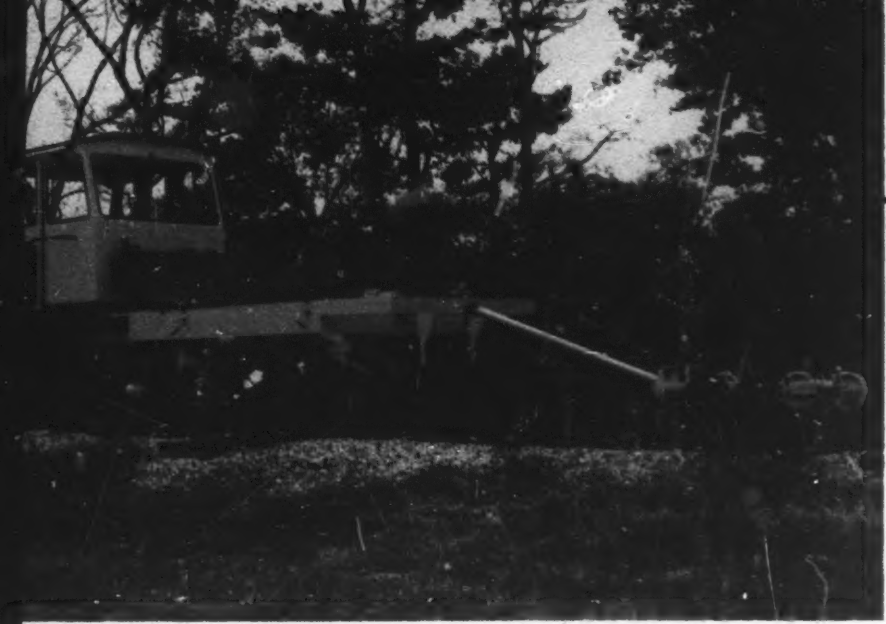
The *Railway Age* projection is that these roads this year will lay 955,000 tons of new rail in renewals. This would be a gain of 80,000 tons, or 9.1%, over last year.

Crosstie renewals this year are projected at about 28 million ties, an increase of 2.3 million, or 8.95% over 1980.

- **Figuring track surfacing.** In calculating these figures on tie and rail renewals use is made of official figures for earlier years compiled and published by the AAR. With track surfacing, however, this procedure cannot be followed: neither the AAR nor any other group compiles figures on the total amount of track surfacing done by Class I roads. However, an indication of the trend of track surfacing is provided by figures on this activity furnished by the railroads that submit figures on rail and tie renewals.

Twenty-four roads submitted figures for this article. The roads giving figures on track surfacing said they surfaced 39,425 miles of track last year, which compares with 37,969 miles surfaced by these roads in 1979. They plan to surface a total of 41,178 miles of track this year.

Why has track surfacing been going up continuously from year to year, even at times when other types of work have declined?



AUTOMATED track-lining machine was introduced in 1980 by Plasser American Corp. Manufacturer says machine has capability of lining track at rate of 2 miles per hour.

The availability of high-speed automated production tamper/liners almost certainly figures importantly in the answer. These machines enable one operator to surface and line 2,000 feet of track or more per hour. When this machine is operated in tandem with a second "slave" machine tamping alternate ties, production can be increased about 75%. Thus, compared with the labor-intensive hand methods formerly used, surfacing has become a quick and economical way to improve the riding qualities of track.

Since the manufacturers keep making improvements in their tampers aimed at getting greater efficiency and productivity, while improving the quality and durability of the work done, there is reason to believe that the railroads will continue to rely increasingly on these machines to keep their tracks in good line and surface.

● **Some negative factors.** It is interesting to note that m/w activity for the Class I roads as a whole is presently gaining even though there are some factors tending to hold it down. Among these are activities on roads that have been depending in some degree on government funding of one kind or another.

Conrail's 10-year track rehabilitation program, started in 1976 with government funding, initially had a stimulating effect on the aggregate demand for new rails and ties and other materials and m/w machinery. But disappointing bottom-line figures for Conrail caused it to depart from the rehab program beginning in 1979, with a negative impact on total m/w activity and the overall demand for materials and m/w machinery.

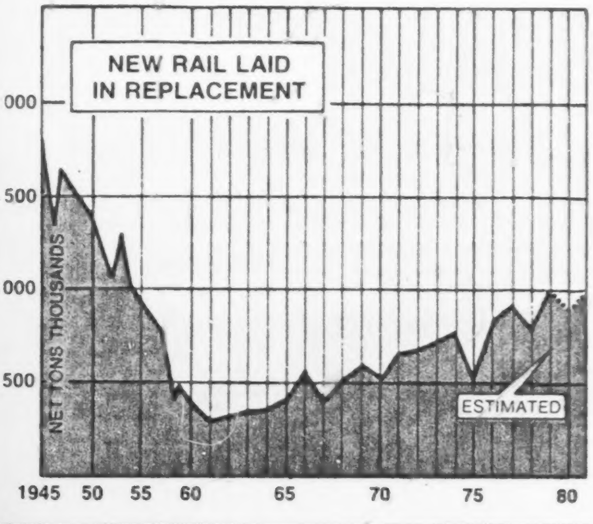
This effect could continue in 1981, primarily because the scope of Conrail's program will depend on action yet to be taken by Congress on a request for additional funding. "We don't know yet what we will do in 1981," said a Conrail spokesman.

Another factor having a negative impact on total m/w outlays is reduced expenditures of 4-R funds for track rehabilitation. Of the $1.6 billion provided in the 4-R Act for this and other purposes all but $63.2 million has been earmarked for projects on various roads, although it is understood that some of these roads still have not spent all the funds allotted to them. What is important is that the peak of 4-R funding has been passed and all that can be expected now is a decline to zero.

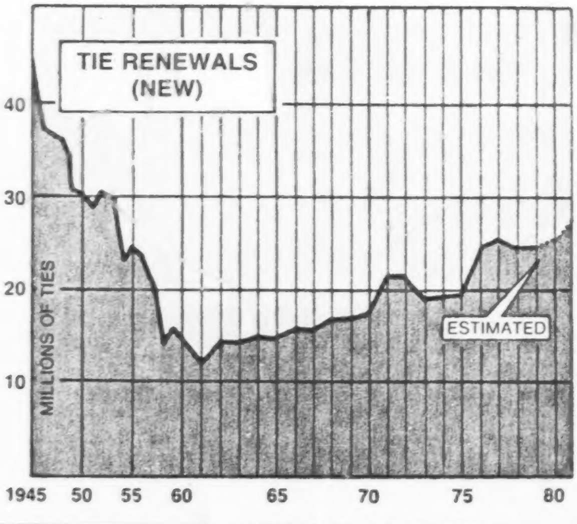
The five-year Northeast Corridor Improvement Project, undertaken in 1976 with $1.75 billion provided by Congress, has had rough going due to inflation and other factors. Originally scheduled to be finished this year, the project has now been extended to September 1985 and total funding has been increased to $2.5 billion.

One effect of this stretch-out is to reduce the consumption of materials being used annually in the work. An indication of this reduction is given by the fact that the amount of new rail being laid in 1981 will be 68 track-miles, only slightly more than one-half of the 124.8 track-miles laid in 1980.

● **Sign of vitality.** The fact that rail and



RAIL RENEWALS on Class 1 railroads from 1945 to date. Decrease in 1980 will be more than overcome in 1981, according to *Railway Age* survey.



TIE RENEWALS, like rail, have shown a substantial recovery from the bad years of the 'fifties and 'sixties. Tie insertions will hit new 25-year high this year.

Today's goal: Build greater durability into the track structure so that renewal cycles may be stretched out.

tie renewals and track surfacing are expected to move up this year in spite of the restraining influences mentioned served to underscore the vitality of m/w programs not dependent on government funding. Another indication of this vitality is that the increases are occurring in spite of large mileages being taken out of service on the Rock Island and Milwaukee Road.

The increases in overall m/w programs planned for 1981 do not mean, of course, that all railroads are participating in the uptrend. Some inquiries to top engineers reveal that railroads expecting to step up their m/w programs frequently have different reasons for doing so.

This point is illustrated by the motivations behind planned increases in m/w programs on three large railroads, all of which, incidentally, carry large amounts of coal traffic. No two of these three roads had the same reason for boosting their 1981 programs.

One chief engineer cited substantial rehabilitation work needed to prepare a route for carrying heavy traffic resulting from a pending merger.

On another road, m/w programs for 1981 were being boosted across the board as part of a program to upgrade the tracks on a systemwide basis. The chief engineer was reluctant to say that the purpose of the enlarged programs was to overcome deferred maintenance, but it was obvious that was the case.

The chief engineer of a third system explained that the heavier m/w programs planned for this year were basically due to cutbacks put into effect in 1980. In other words, the m/w forces were "picking up" in 1981 needed work that was not done last year.

All of these examples possess a common characteristic, an apparent feeling of confidence among their managements that business prospects for 1981 justify the increased expenditures. One might even go a step further with the observation that this spirit of confidence—call it cautious optimism, if you will—is not hard to find anywhere in the railroad industry.

● **Money not the only factor.** While it may be assumed that money is the most important single factor in the battle to achieve adequate track maintenance, there are other elements in the equation.

One of these is machinery. The m/w forces of practically all big railroads are now highly mechanized. In the process, the railroads have made great savings in labor costs. In fact, so great have been these savings that the question may be raised: Since the m/w labor force has been reduced so much, where, or how, can further large savings be made?

Of course, efforts to get improved results from mechanization are continuing. The manufacturers continue to make significant improvements in their machines. But no entirely new types of machines were introduced in 1980 and, so far as is known, none is in the works for 1981.

Certainly there are no machines on the horizon that promise labor savings of the magnitude achieved during the years when mechanization was making inroads into a labor force that was still pretty much confined to hand tools. The fact is that mechanization has skimmed the cream off of potential labor savings.

But m/w officers are watching uneasily as the wage rates of unionized m/w employees continue to go up year after year even as they did during the post-war years. At that time newly developed labor-saving machines could be thrown into the breach to keep labor costs from getting entirely out of hand.

● **What happens now?** The machines saved the day. But what happens now? What can be done to keep continually increasing wage rates from forcing unit costs of maintenance work to levels so high that the amount of work done will have to be reduced in order to keep expenses within the confines of the amount of money made available to do the work?

There is an answer, and m/w departments are working hard at it. But the potential savings are limited, and anyway there is a counteracting factor in the situation that threatens largely to nullify their efforts. The answer is to build greater strength and durability into the track structure to the end that renewal cycles of its components—rails and ties mainly—can be stretched out, while less work will be required to keep it in good line and surface, thereby keeping labor costs down.

Track engineers have, of course, been working to strengthen the track structure for many years. The trend to heavier rails is an example of what they have been doing. More recently the emphasis has been on ways to lengthen the life of rails, especially on curves in heavy-traffic territory, through the use of so-called premium rails—those that have been hardened either through heat treatment or the use of alloys such as silicon, chromium, molybdenum and vanadium.

● **Use of premium rails.** These efforts are now being accelerated. Several large roads report that they have recently obtained quantities of alloy-steel or heat-hardened rail from Germany and Japan, some of which is being used on an experimental basis. So far results are reported to be satisfactory.

CF&I says its CROMORAIL is now in production and that its acceptance by the railroads has been "surprisingly good." As the result of a change in chemistry this chrome/moly rail reportedly can be butt-welded in about the same length of time required for carbon-steel rail. Also, as a result of improvements in the company's rail mill at Pueblo, Colo., rail can be rolled in lengths considerably longer than the standard 39 feet.

Other measures currently being used to improve track performance on curves include the use of larger than standard tie plates and various types of clip-type fastenings, although most roads are clinging to the cut spike as the preferred type of rail fastening, on curves as well as tangents. To facilitate rail changeout and transportation on curves, Union Pacific has adopted the use of 78-foot rails in lieu of cwr on curves of 2 degrees and over.

● **What about concrete ties?** Still under consideration for increasing the durability of the track structure is the concrete tie. A few roads, including Amtrak in the Northeast Corridor and the Florida East Coast, are continuing to use concrete ties on a regular basis. Other roads have test installations under observation. As yet no other major road has moved in the direction of using them regularly for renewal purposes, although Santa Fe last year installed 29,000 concrete ties in constructing a new branch line.

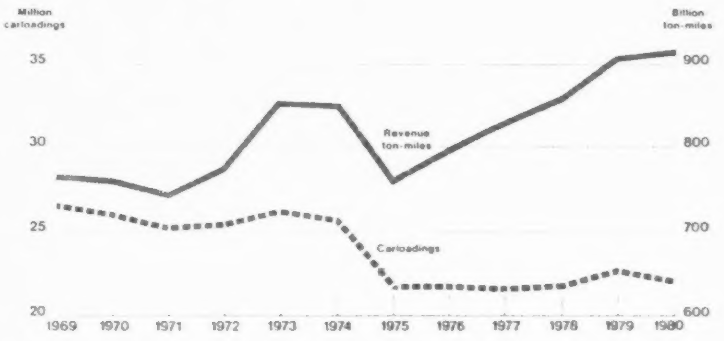
It should be noted, too, that CN Rail is continuing its policy of installing concrete ties out of face in certain territories of heavy curvature and traffic. Since this program was started several years ago more than a million concrete ties have been installed.

● **Counteracting factor.** As indicated above, there is an element in the situation tending to counteract efforts to reduce maintenance costs by strengthening the track structure. That element is the accelerated wear and tear imposed on the track structure by increased use of 100-ton cars, many of them operating in unit trains. The fact is that protection of the track from the heavier loads is doubtless the principal reason for the efforts to strengthen the track.

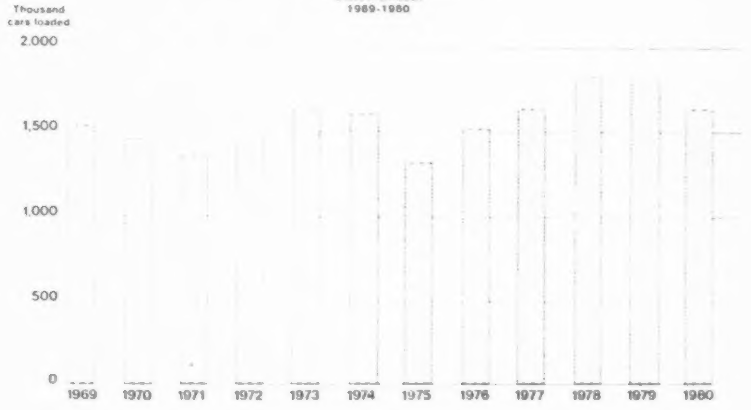
So it appears that track engineers in their efforts to reduce maintenance costs via this route are not much farther ahead than they were in the beginning. True, they are getting some increased life from the premium rail being used, and perhaps savings may be attributed to other steps being taken such as geotextiles in soft subgrades; but it is doubtful if these are sufficient to counter more than a small part of increased labor costs. ■

Deregulation helps ease the pains of recession

Freight traffic trends
Class I railroads
1969-1980



Revenue carloadings of T-O-F-C traffic
Class I railroads
1969-1980



Two main themes ran through Chapter 1980 of the 20th Century History of Railroading: One had to do with deregulation, the other with recession, each had to do with the industry's ability to cope—and cope the railroads did, in better fashion than might have been expected.

First, deregulation. In theory, an easing in regulation was supposed to have begun a few years ago with passage of the Railroad Revitalization and Regulatory Reform Act of 1976, but the Interstate Commerce Commission at that time had its own interpretation of the intent of Congress and not much "reform" resulted, not much at least that was beneficial. Then the Carter Administration made transportation deregulation a major goal and Congress moved, first on airline deregulation, then on motor-carrier deregulation, and finally on railroad deregulation—with passage of the Staggers Rail Act of 1980, which the President finally got to sign in October. In the meantime, a somewhat revamped ICC, knowing an ominous throat-clearing when it heard one, was moving on its own to ease up on railroad regulation. One result of this was that railroads were able to weather the recession, as the AAR put it, "without a serious setback."

This downturn, like the one that plagued a Republican Administration in 1975, was recession-plus-inflation, something most economists had dismissed as an impossibility before 1975. It struck hard in key areas important to railroads, including the automobile and housing industries. Loadings of motor vehicles and parts in 1980 were off by about 25%, while volume of lumber and wood products fell by more than 20%. And yet, yearend found the railroad industry, overall, with financial results slightly better than those recorded the year before. What happened? What happened was, first, that grain and coal loadings showed substantial increases, increases that might not have been predicted as 1980 began (especially with the impact of the Russian grain embargo to be considered). What happened was, second, that the Commission did not merely sit on rate-increase proposals, granting rate hikes which, over the year, added up to 10.3%. This was less than the percentage increase in the Consumer Price Index, for example, it was less than the increase in the indices for railroad equipment and materials and it was far less than the increase (49%) in fuel costs. But it was enough, as it turned out, to prop the industry up and enable it to battle recession to a virtual standoff—though, as is usually the case, some roads came through the fight less scarred than others.

Among the other highlights of 1980:

—Despite recession and the high cost of money, railroads and other investors pumped an estimated $6.2 billion in capital expenditures into the industry. Capacity of the freight-car fleet continued its steady climb, and additions to the fleet outnumbered retirements as they had in 1979. The market was hardly stable in terms of new orders, however, and backlogs declined as the year progressed, leaving carbuilders with an uncertain outlook so far as 1981 production was concerned.

—Uncertain, too, was the outlook in the area of management/labor relations. For one thing, the Railroad Retirement system was facing financial difficulties again, and carriers and unions ended '80 without any agreement on how these problems should be solved. At the same

Carloadings by commodities 1980 vs. 1979

Commodity	1980	1979		Incr/Decr. 1980 vs. 1979 Cars	Percent
Grain	1,573,313	1,429,244	I	144,069	10.1
Other farm products	235,845	222,821	I	13,024	5.8
Metallic ores	1,479,857	1,765,875	D	286,018	16.2
Coal	5,706,434	5,255,980	I	450,454	8.6
Crushed stone, gravel and sand	716,491	854,110	D	137,619	16.1
Nonmetallic minerals	770,243	783,685	D	13,442	1.7
Grain mill products	878,704	918,556	D	39,852	4.3
Food and kindred products	925,163	954,490	D	29,327	3.1
Primary forest products	1,002,033	1,055,665	D	53,632	5.1
Lumber and wood products except furniture	469,447	596,817	D	127,370	21.3
Pulp, paper and allied products	1,060,487	1,097,932	D	37,445	3.4
Chemicals and allied products	1,411,160	1,488,616	D	77,456	5.2
Petroleum products	296,752	335,997	D	39,245	11.7
Stone, clay and glass products	792,402	944,328	D	151,926	16.1
Coke	276,329	359,824	D	83,495	23.2
Metals and products	820,263	984,022	D	163,759	16.6
Motor vehicles and equipment	853,850	1,123,104	D	269,254	24.0
Waste and scrap materials	632,733	713,749	D	81,016	11.4
Forwarder and shipper association traffic	555,041	642,508	D	87,467	13.6
All other carloads	2,129,816	2,343,575	D	213,759	9.1
LCL traffic	11,685	20,837	D	9,152	43.9
Total cars loaded	**22,598,048**	**23,891,735**	**D**	**1,293,687**	**5.4**

Methods of shipping motor vehicles from factories 1969-1980

Year	Vehicles shipped	Highway %	Railroad %
1969	10,147,000	48.2	51.7
1970	8,239,000	45.3	54.7
1971	10,638,000	47.5	52.5
1972	11,270,000	47.8	52.2
1973	12,637,000	48.0	52.0
1974	10,058,000	44.8	55.2
1975	8,985,000	46.4	53.6
1976	11,477,000	48.5	51.5
1977	12,639,000	49.3	50.7
1978	12,871,000	49.4	50.6
1979	11,456,000	50.1	49.9
1980 (9 mos.)	5,849,959	52.0	48.0

Source: Motor Vehicle Manufacturers Association of the United States, except column 2 and 3 for 9 mos. 1980 estimated by AAR.

time, the organizations were spending the last weeks of 1980 getting ready for the wage/benefit bargaining that would begin in '81. All indications were that the new demands would not be modest ones, with labor looking not only for substantial increases in basic wage rates but also for full protection against cost-of-living increases and even for what amounted to retroactive protection against the inflation of the past several years.

—Back at the ICC, the prompt action noted on rate cases was paralleled by prompt action on matters related to railroad consolidation. This added up to a busy year for map-makers, who had to take into account two major mergers and two major acquisitions which took place in 1980, even as they looked ahead to the changes that might be coming as a result of two additional mergers proposed during the year. Meanwhile, other changes in the map were being made as a result of the Rock Island and Milwaukee Road bankruptcies, with Milwaukee taking the more active role in sale of lines.

—Signals sent out by the November election hinted that there would be restrictive aspects displayed for the two major railroads receiving government assistance, Amtrak and Conrail. Both continued to lose heavily, and a late-year report on Conrail indicated a need for long-term continuing government aid even if substantial cutbacks were made in operations and costs.

—In the area of technological development in railroading, 1980 may go down as one of the most active years ever. Suppliers seemed to be sending out their own signals, and they were positive, reflecting a long-range optimism about rail-industry growth and about the industry's continuing need to upgrade equipment and plant. Especially noteworthy were locomotive builders' efforts to boost fuel-efficiency and improve reliability, and a widespread interest in the development of new (and sometimes exotic) equipment for use in intermodal operations. Noteworthy, too, was a renewal of interest in railroad electrification, though the financial problems associated with it were not ones that looked easy or quick of solution.

In sum, it could be said that railroads ended the decade in a lot better shape than they had started it, when much of the industry in the Northeast was in a state of financial collapse and when doomsayers could see the rest of the industry following in fairly short order. Perhaps it took crisis to provoke action—by the industry and, most important, by government—but action did come. Result: While the industry is still troubled by what the AAR calls the "competitive equity" factor, it's starting the new decade on a positive note, in good part because of 1980's regulatory reform.

Traffic/service

Given the fact that the nation's economy was in recession for much of the year, rail traffic in the overall held up well. Despite reductions in carloadings in 18 of 21 commodity categories and a drop of about 5.4% in total loadings, transportation output as measured by ton-miles stayed about even with the 913-billion-plus record set in 1979. Among the factors at work: Ton-mile gains recorded in the first quarter of '80 worked to offset decreases

Freight and passenger traffic 1968-1980

Year	Revenue carloadings (thousands)	Piggyback carloadings (thousands)	Revenue ton-miles (millions)	Revenue passenger-miles (millions)
1969	28,237	1,540	e767,841	e12,159
1970	27,160	1,450	764,809	10,740
1971	25,266	1,356	739,743	8,833
1972	26,105	1,448	776,746	8,558
1973	27,338	1,631	851,809	9,295
1974	26,184	1,610	850,961	10,333
1975	23,218	1,308	754,252	9,934
1976	23,457	1,506	794,059	10,304
1977	23,173	1,689	826,292	10,293
1978	23,355	1,841	858,105	10,222
1979	23,877	1,858	913,669	11,306
1980	22,598	1,660	e914,600	e10,700

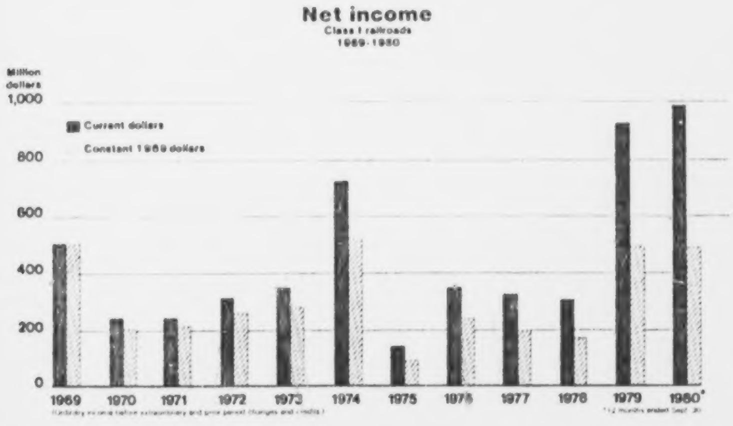
e Estimated

Note: Piggyback carloadings shown above include mail and express. Revenue passenger-miles include National Railroad Passenger Corp. (Amtrak) beginning with year 1971 and Auto-Train Corp. for years 1972-77.

Operating revenues 1969, 1979, 1980

	1969 (millions)	1979 (millions)	12 mos. to 9/30/80 (millions)
Freight	$10,551	$23,447	$25,581
Passenger	439	382	423
All other	460	1,390	1,455
Total	**11,450**	**25,219**	**27,459**

Note: Mail and express included in freight revenue.



(Ordinary income before extraordinary and prior period charges and credits.)

*12 months ended Sept. 30

that came later; and carloadings increases were posted for both grain (better than 10%) and coal (close to 9%), with much of this traffic moving by unit train over long distances. The only other commodity category to show an increase was farm-products-other-than-grain, and here the deregulation of rail movement of perishables (put in place by the ICC in 1979 and expanded in '80) played a big part: For the first 12 months after dereg, volume went up by about 26% and rail market-share jumped by a couple of percentage points.

As for intermodal operations, at first glance 1980 shaped up as a bad year, with trailer/container loadings off by almost 9%. A second look, however, put '80 in a different perspective: In the recession of 1975, TOFC/COFC dropped not by 9% but by 20%, and Plan 3 piggyback actually went up last year by 16% (reflecting strength in rail/water bridge traffic and in movement of perishables).

With only a few scattered exceptions, freight-car supply was no problem during 1980. ICC, meanwhile, took several significant actions in areas related to car supply and utilization, actions which gave the industry more control over its own practices in such matters as car-hire and enforcement of car-service rules.

Freight rates

Shippers were charged more last year for movement of their freight, with the ICC approving rate increases totaling 10.3%. This compared with somewhat greater increases in some of the indices railroads had to contend with, increases of more than a 10.3 in fuel and material prices. Revenue per ton-mile, 2.718 cents in 1979, rose to 2.830 cents in 1980.

Financial results

With increases in revenues slightly outpacing increases in expenses, railroads were expecting final figures on 1980 to show a modest improvement in net railway operating income, ordinary income and rate-of-return. Projections indicated that total operating revenues would come in at about $28.3 billion, up by 12.1% from 1979 levels, with total operating expenses climbing by 11.1% to about $26.6 billion. On the revenue side, increases in coal and grain traffic helped, as did prompt ICC action on rate increases; on the expense side, railroads were looking at year-to-year increases of 49% in fuel costs, of more than 11% in the cost of other materials, and of 9% in wage costs (including supplements). For the first nine months, rate-of-return on net investment stood at 3.17%, up from 2.64% for the same period in 1979.

Capital expenditures

Spending for capital improvements to railroad equipment and plant continued to climb last year, with total expenditures by railroads and others expected to hit $6.2 billion. Of this, about $3.68 billion was invested by Class I railroads, with slightly more than $1 billion going for improvements to fixed plant and the rest spent for rolling stock. Equipment expenditures resulted in deliveries of about 90,000 freight cars and 1,700 locomotive units during the year, and these deliveries translated into net increases (after retirements) in the freight-car and locomotive fleets for the second straight year.

Management/labor

Conflict was the exception rather than the rule in 1980 in rail management/labor relations, in that last full year of a contract agreement that's subject to change April 1. In individual negotiations, railroads continued to work on crew-consist, with some success. At the same time, cooperative efforts were being made to develop better ways of handling Rule G, with emphasis on prevention of alcohol and drug abuse, on employee involvement in enforcement, and on provision of a "second chance" for offenders under certain circumstances.

Within labor, meanwhile, there was both a coming-together and a falling-apart. The Brotherhood of Railway and Airline Clerks absorbed the Supervisors organization, which became a division of BRAC. But the Railway Employes' Department, which had been going on for some time without the Machinists and the Sheet Metal Workers, lost the Carmen; then RED, reduced to three relatively small unions, closed up shop. For its part, the Carmen's union, fighting to organize the many private car-repair shops that have sprung up, opened a second front, serving notices aimed at a tightening-up of contracting-out of work.

As 1980 wound down, one major union, BRAC, circulated a working-paper dealing with possible bargaining approaches for 1981. Among other things, it suggested an indexing of wage increases, inclusion of a standard-of-living improvement factor and a catch-up on wages allegedly lost to inflation during the life of the existing agreement because of the cap placed on cost-of-living adjustments. The first notices actually served, however, came on Jan. 2 from the Brotherhood of Railroad Signalmen; they included demands for a c-o-l catch-up and for wage increases in three steps which would compound to more than 53%.

As for labor's position and its strength

Railroad cost of capital

	1978 Ex Parte No. 353	1980 Ex Parte No. 381
1. Embedded cost of debt	7.0%	7.8%
2. Current cost of debt	8.4	10.0
3. Current cost of equity	14.0	13.5
4. Cost of capital as measured by rate of return on net investment base	12.5	11.22

Source: ICC decisions

Rate of return on net investment and net income 1969-1980

Year	Net railway operating Income a (millions)	Rate of return on investment after depreciation a (millions)	Net income after fixed charges b (millions)	Net income in constant 1969 dollars (millions)
1969	$655	2.36%	$514	$514
1970	486	1.73	227	216
1971	595	2.12	247	223
1972	654	2.34	319	277
1973	650	2.33	359	294
1974	768	2.70	730	545
1975	351	1.20	144	98
1976	452	1.60	355	231
1977	343	1.24	326	200
1978	427	1.52	307	175
1979	837	2.87	938	491
12 mos. to 9/30/80	946	3.17	996	488

a After provision for deferred taxes beginning in 1971

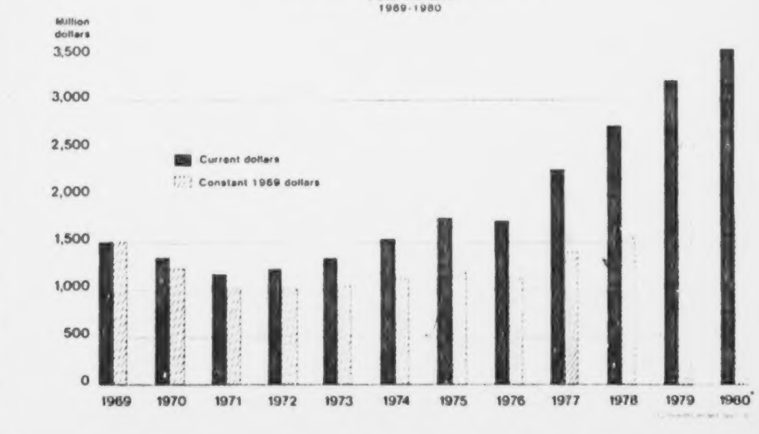
b After provisions for deferred taxes beginning in 1971 and including equity in undistributed earnings of affiliated companies beginning in 1974.

Note: Statistics shown above and elsewhere in the tables are for Class I line-haul railroads, excluding National Railroad Passenger Corp. (AMTRAK) and Auto-Train Corp., unless otherwise indicated.

Capital expenditures

Class I railroads

1969-1980



politically, last November's elections were bound to bring some reassessment in light of the Republican takeover of the Presidency and the Senate and in light of the retirement or defeat of a number of labor's good friends in both houses of Congress. At the very least, observers noted that if 1981 negotiations reached a sticking point and emergency boards resulted, those boards would be created and their members appointed by a conservative President (albeit one who had himself served as a union leader). Sources in labor, meanwhile, tended to discount forecasts of loss of influence, noting that labor's support had by no means gone entirely to the party and the people turned out of office.

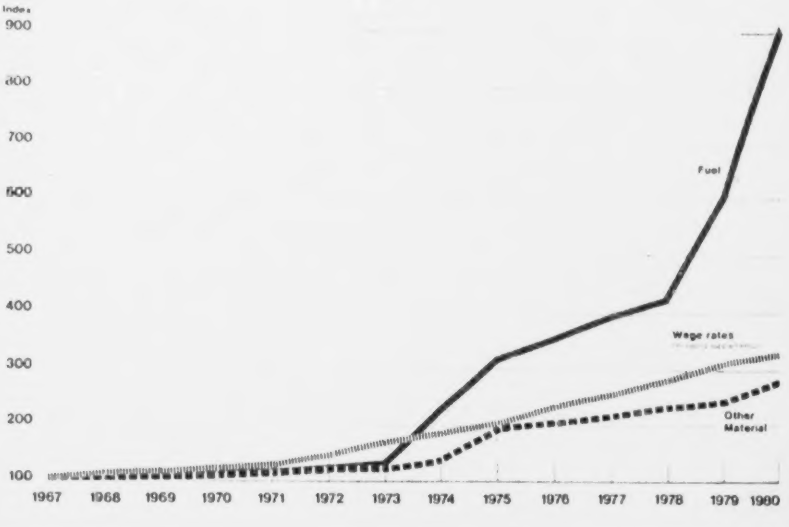
Prices and revenue averages — 1967-1980

Year	Consumer price index (1967 = 100)	Producer price index for railroad equipment (1967 = 100)	Revenue per ton-mile (cents)	Revenue per passenger-mile (cents)
1967	100.0	100.0	1.269	3.195
1968	104.2	103.1	1.310	3.389
1969	109.8	108.8	1.347	3.608
1970	116.3	115.1	1.428	3.914
1971	121.3	121.1	1.593	4.306
1972	125.3	128.7	1.618	4.747
1973	133.1	134.7	1.617	4.756
1974	147.7	163.8	1.853	5.207
1975	161.2	201.2	2.041	5.396
1976	170.5	216.7	2.191	5.744
1977	181.5	233.5	2.286	5.916
1978	195.3	252.7	2.462	5.968
1979	217.7	277.3	2.718	6.270
1980 est.	247.0	312.0	2.830	6.915

Note Revenue per passenger-mile figures include Amtrak statistics beginning with 1971 and include Auto-Train for years 1972-77

Railroad cost trends

Class I railroads
1967-1980
[1967 = 100]



Conrail

Conrail's plant and equipment were in better shape in 1980, and one of the industry's most-respected figures was set to come on board as chairman (L. Stanley Crane, late of Southern). But fish-or-cut-bait time appeared to be nearing as losses continued to be large. USRA began major studies of CR's outlook, and in a preliminary report issued in December the overseeing agency was not optimistic: Even if certain cutbacks can be made, USRA found, substantial additional federal aid may be required through 1985. The amounts of that possible additional aid: $1.5 billion to $2.1 billion. For a report due early in 1981, USRA said it would be looking at the actual rail-service needs of CR territory and at whether CR should provide them. Conrail itself had indicated earlier that it would require more help, in a range that went from somewhat lower than the USRA estimate to much higher.

Competitive transportation

Before rail deregulation, there was motor-carrier deregulation, and the fallout from this legislation has yet to be fully assessed. Based upon a half-year's experience, however, it seemed to point to creation of more problems for the truckers themselves than for their competitors.

On a couple of other fronts:

—Work began, late in 1980, at Alton, Ill., on a new Mississippi River facility downriver from Locks and Dam 26. Railroads and environmentalists had thus lost a long battle against the Corps of Engineers' project; yet to be decided was the fate of an add-on (a second lock) which waterways interests wanted. Meanwhile, work continued on a second waterways project opposed by railroad interests, the Tennessee-Tombigbee.

—Eminent-domain legislation for coal-slurry pipelines again failed to get through Congress, but it was there and it will be there again in 1981. •

Deregulation

It was a cliffhanger all the way—but on Oct. 14, President Carter signed the Staggers Rail Act of 1980, and deregulation came to the railroads. It was not, as the AAR pointed out, "wholesale" deregulation, but it did substantially ease the regulatory burden on the industry.

In the rate-making area, these were among the major provisions of the legislation:

—Close to two-thirds of all rates will be free of ICC maximum-rate regulation. ICC jurisdiction will be limited to rates where railroads have market dominance and make charges above a threshold level set at 160% of variable costs; that threshold will rise five percentage points a year until 1984; then, it will depend on a cost-recovery percentage to be determined by the Commission, one that can vary between 170% and 180% of variable costs.

—A railroad will be able to raise any rate by the percentage increase in the rail cost index; for the first four years, rates can be boosted by up to 6% a year above the cost recovery index (to a cumulative maximum of 18%), and after that increases will be limited to 4% and, for the most part, to carriers not earning adequate revenues. Provision is made for rate protests, but ICC's powers are restricted.

—Rate reductions will be more easily made. Under the new law, any rate that contributes to the going concern value (defined as a rate that meets or exceeds variable cost) will be regarded as reasonable.

—General rate increases will be limited to joint rates, with elimination scheduled by Jan. 1, 1984, unless ICC finds that this would not be feasible; general increases are to be limited to amounts needed to recover on inflation costs.

—Rate bureaus will not be allowed to discuss or vote on single-line rates, and discussion/voting on joint-line rates will be limited to carriers that can "practicably participate" in the movement. By Jan. 1, 1984, discussion of joint-line rates must be limited to roads forming part of a particular route.

—A complicated formula for application (and cancellation) of surcharges will be in effect for the next three years, basically providing that a carrier may apply a surcharge to any joint rate that fails to yield it 110% of variable cost.

—Contract rate agreements, which ICC had been permitting, were specifically made legal.

—The time frame for suspension and investigation of a rate is reduced; in order to get a suspension, a shipper will have to demonstrate likelihood that it will win on the merits of its case, that it will suffer substantial injury through application of the rate, and that a refund would not be adequate protection.

On matters related to car-service, ICC orders will be restricted to emergency situations with national or regional significance, while the Commission's power to require joint use of terminals during emergencies will be expanded. The legislation also provides that premium charges may be levied for special services to improve car utilization; it eliminates incentive per diem; and it authorizes shippers to try to reach agreement among themselves on private-car compensation and then to

Condensed income account
1969, 1979, 1980

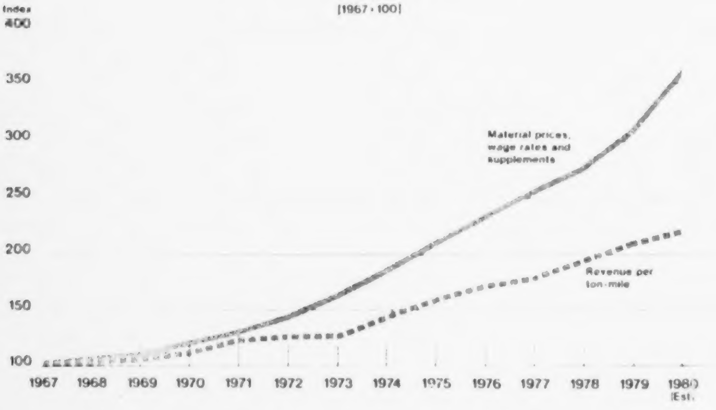
	1969 (millions)	1979 (millions)	12 mos. to 9/30/80 (millions)
Total operating revenues	$11,450	$25,219	$27,459
Total operating expenses[1]	10,747	23,994	25,998
Income taxes on ordinary income[2]	106	199	233
Provision for deferred taxes	—	211	308
Net railway operating income	655	837	946
Net ordinary income	514	938	996
Net income in constant 1969 dollars	514	491	488

Note: Date based on the new Uniform System of Accounts (U.S.O.A.), effective Jan. 1, 1978

1. Operating expenses include rents and taxes other than income taxes
2. Data for 1979 and 1980 include a small amount of state taxes

Revenue and cost trends

Class I railroads
1967-1980
[1967 = 100]



Trend in railroad fuel prices[a]

(cents per gallon)

Year	U.S.	East	South	West
1969	9.58	9.84	10.44	9.23
1970	9.92	10.13	10.62	9.68
1971	10.29	10.70	10.98	9.92
1972	10.52	10.92	11.27	10.14
1973	12.26	12.74	12.94	11.84
1974	24.43	25.19	25.06	24.01
1975	28.91	30.05	29.75	28.09
1976	31.44	32.55	32.31	30.67
1977	34.99	36.81	36.18	33.77
1978	36.54	38.48	37.50	35.36
1979 (Dec. 3)	72.68	72.18	70.05	73.69
1980 (Dec. 1)	87.04	87.95	87.57	86.51

[a] Yearly averages based on AAR Fuel Index except that 1979 and 1980 prices are based on Ex Parte No. 311 questionnaire responses from all Class I railroads.

Annual rates of inflation 1979-1980

(1967 = 100)

Month	Producer price index	Consumer price index	Spot price index of railroad material prices and fuel
1979			
January	220.8	204.7	296.3
February	224.1	207.1	—
March	226.7	209.3	—
April	230.0	211.8	316.9
May	232.0	214.3	—
June	233.5	216.9	—
July	236.9	219.4	367.3
August	238.3	221.5	—
September	242.0	223.7	—
October	245.6	225.6	404.7
November	247.2	227.6	—
December	249.7	230.0	—
1980			
January	254.9	233.3	430.9
February	260.2	236.5	—
March	261.9	239.9	—
April	262.8	242.6	457.6
May	264.2	245.1	—
June	265.6	247.8	—
July	270.4	248.0	468.8
August	273.1	249.6	—
September	274.1	251.9	—
October	277.0	254.1	470.8
Annualized rate of inflation 10/79 - 10/80	12.8%	12.6%	16.3%

Employees and their compensation 1968-1980

Year	Number of employees [1]	Number of employees [2]	Total payroll (100s) [2]	Average annual earnings per employee [1]	Average Hourly rate [2]	straight-time Hourly earnings [2]
1968	—	590,536	$5,110,636	$ 8,654	$3.47	$3.74
1969	—	578,227	5,362,754	9,274	3.70	4.00
1970	—	566,282	5,711,280*	10,086*	4.05*	4.35*
1971	544,497	544,333	5,999,968*	11,023*	4.52*	4.84*
1972	527,235	526,061	6,424,920	12,213	4.94	5.32
1973	524,422	520,153	7,083,338	13,627	5.43	5.83
1974	533,277	525,177	7,475,834	14,235	5.72	6.16
1975	494,348	487,769	7,474,000*	15,324*	6.30*	6.77*
1976	496,491	482,882	8,278,400	17,144	6.96	7.49
1977	501,389	482,731	8,939,400	18,518	7.51	8.15
1978	491,254	471,519	9,700,600	20,573	8.25	8.85
1979	502,802	482,789	10,903,887	22,474	9.02	9.66
1980 est.	482,300	460,900	11,430,300	24,800	9.96	10.67

* Adjusted to include retroactive increases.

[1] Includes Amtrak beginning in 1971 and Auto-Train for years 1972-77.

[2] Excludes Amtrak and Auto-Train.

negotiate with the carriers, with ICC serving as the court-of-last-resort.

On abandonment proceedings, Congress left the standards as-is, but changed the time frames in order to speed things up. Mechanisms were also put in place for subsidy/purchase of to-be-abandoned lines.

Conrail was affected by several provisions. Under one, the 4R Act redeemable preference share program will be continued for two years with an additional $700 million authorized, $200 million of which is earmarked for a reduction in the labor force of CR; under another, new reports and recommendations must be prepared by both USRA and CR with respect to funding requirements and alternatives, and CR must develop reports on alternatives to current labor agreements and on potential savings from the 1980 Act, from possible property transfers and abandonments and from other sources. In the meantime, an additional $329 million in government investment was made available.

Perhaps most controversial were two other provisions of the new law, provisions vigorously protested by Burlington Northern. In one, a cap (lasting until well into 1987) was placed on rail coal rates to San Antonio; under the other, DOT was ordered to take final action on Chicago & North Western's loan-guarantee application, covering Powder River Basin line construction and rehabilitation costs, within 75 days after the issuance of a final environmental impact statement.

Reorganization

For Rock Island, 1980 was a time for disposal—disposal of its Golden State route and of freight cars and motive power, but as the year ended other roads were continuing to operate major segements of RI lines without having been able to work out purchase agreements. Milwaukee Road, meanwhile, was able to work out sale of a number of sections of railroad and other properties; and it was hard at work toward reorganization as a "Milwaukee II" midwestern system which it believed could be made to work as a viable entity, one that might later be acquired by another road. Late in the year, the ICC, which had been less than sanguine before, came up with more-positive findings based on Milwaukee's being able to reduce labor and equipment costs; Milwaukee was working toward both of those goals. And then there was Boston & Maine, in bankruptcy proceedings during all of the 1970s; late in '80, B&M filed its third proposed reorganization plan.

Merger/consolidation

You would have to go back a long time to find a year in which there was more movement than in 1980 in terms of putting new railroad systems together. Grand Trunk Western completed its purchase of Detroit, Toledo & Ironton. Burlington Northern brought Frisco into the fold. Chessie System and Seaboard Coast Line Industries merged to create CSX Corp. Southern Pacific acquired the Rock Island line between Santa Rosa, N.M., and St. Louis via Kansas City. Union Pacific and Missouri Pacific filed application with the ICC for a merger which would include acquisition of Western Pacific. Southern and the NW, which had fired-and-fallen-back on merger once before, reached agreement the second time around. Sizable pieces of bankrupt Milwaukee Road were sold off, especially in the Northwest, and there was no lack of interest on the part of railroads, shippers and shipper groups and state agencies in acquiring parts of both Milwaukee and RI. Santa Fe and Southern Pacific, meanwhile, talked about merger but failed to come to agreement.

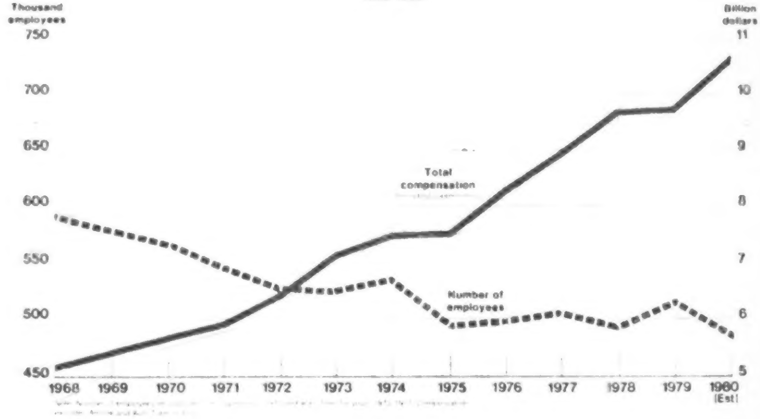
For the most part, railroads appeared ready for this new wave of consolidation and even rail labor mounted only token opposition. Katy, joined by others including labor, did succeed in delaying the BN/Frisco merger in the courts, but eventually the Commission's pro-merger decision was upheld. Labor sought ICC reconsideration of the Chessie/Seaboard merger, but its request was rejected and CSX came into being. SP however, made its move before rather than after the fact, beginning a court challenge to the UP/MP/WP consolidation.

For its part, the Commission was moving expeditiously on merger proposals (even more rapidly in an instance or two than the 4R Act required) and it was not enthusiastic about imposing restrictive conditions. But with the growth of this new merger movement, the ICC did warn that it would not be a rubber-stamp for every merger the industry could come up with.

The year was not without its odd moments. SP, for example, found it advisable to say that it was studying a merger; but it didn't identify its prospective partner, and it was left for hastily-called press conferences to make it known that Santa Fe was the other party. And then there was BN/Frisco. The U.S. Court of Appeals in New Orleans lifted a stay order which had blocked merger and the merger documents were almost immediately filed. Then one Supreme Court justice, apparently unaware of the filing, entered his own stay order: BN and Frisco were

Employment and compensation

Class I railroads
1968-1980



New and rebuilt equipment installed 1969-1980

Year	Freight cars	Passenger-trains cars	Diesel-electric units
1969	75,661	265	1,241
1970	75,136	318	1,093
1971	60,633	281	1,276
1972	49,983	347	1,577
1973	59,170	92	1,339
1974	67,409	100	1,282
1975	73,992	272	810
1976	53,630	358	568
1977	53,817	158	996
1978	70,458	44	1,443
1979	90,717	116	2,007
1980 est.	90,000	n.a.	1,900

n.a. Not available

Note: Freight-car installations include cars of all railroads and private car lines. Passenger-train car and diesel-electric unit installations include Amtrak and Auto-Train for the years 1972-1977.

Railway current ratio

Dec. 31	Current assets (millions)	Current liabilities (millions)	Current ratio
1969	$3,378.6	$3,563.4	0.9
1970	3,582.5	3,523.9	1.0
1971	3,585.9	3,647.8	1.0
1972	3,611.6	3,672.3	1.0
1973	4,055.9	3,898.0	1.0
1974	4,553.2	4,333.7	1.1
1975	4,487.8	4,457.1	1.0
1976	5,181.2	4,907.5	1.1
1977	5,830.1	5,338.9	1.1
1978	6,791.3	6,226.2	1.1
1979	7,734.8	7,169.5	1.1
9/30/80	7,994.7	7,325.3	1.1

Note: For the years 1969-74, data are based on the consist of Class I railroads for each respective year; beginning with 1975, statistics are based on the 1979 Class I consist excluding the Long Island Rail Road.

Index of wage rates and material prices 1967-1980

(Average 1967 = 100)

Year	Wage index	Wage sales and suple-ments	Fuel	Other material	Total material	Index of wage rates and prices	Wage rates and prices including supple-ments
1967	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1968	105.1	106.3	103.5	102.6	102.7	104.7	105.7
1969	112.2	113.6	106.7	105.5	105.8	110.9	112.3
1970	122.7*	125.6*	110.5	109.4	109.7	120.2*	123.0*
1971	136.8*	139.4*	114.6	113.5	113.7	131.2*	133.7*
1972	149.5	153.4	117.1	118.7	118.1	141.8	145.6
1973	164.4	173.9	136.5	122.9	126.7	155.2	163.5
1974	173.4	189.1	272.0	142.1	178.9	174.7	186.8
1975	190.8*	207.1*	321.9	190.2	227.2	202.2*	212.6*
1976	210.7	232.0	350.1	203.2	244.5	221.3	235.4
1977	227.3	251.6	389.6	217.2	265.3	239.2	255.4
1978	250.0	276.5	406.9	230.6	279.9	259.4	277.4
1979	273.2	303.8	606.4	252.5	347.8	296.5	315.9
1980 (prel.) .	301.6	331.4	905.7	291.4	454.3	349.4	365.2

*Reflects inclusion of retroactive wage increases

Inventory of equipment 1969-1980

December 31	Freight cars*	Passenger cars (incl. Pullman)	Head-end passenger-train cars	Diesel locomotive units	Other locomotive units
1969	1,791,736	8,343	4,083	26,714	319
1970	1,784,181	7,953	3,224	26,796	290
1971	1,762,135	6,804	1,909	26,897	292
1972	1,716,937	6,541	1,048	27,070	294
1973	1,710,659	6,270	919	27,550	250
1974	1,720,573	6,077	771	27,857	227
1975	1,723,605	5,834	637	27,985	225
1976	1,699,027	4,879	599	27,380	229
1977	1,666,533	4,907	605	27,450	217
1978	1,652,774	3,979	514	27,241	211
1979	1,700,310	3,820	421	27,275	175
1980 est.	1,710,000	n.a.	n.a.	27,300	170

*All cars, railroad and private.
n.a. Not available.

Note: Figures shown for passenger equipment include National Railroad Passenger Corp. (Amtrak) beginning with 1971. Number of locomotives shown includes Amtrak beginning with 1972 and Auto-Train Corp. for years 1972-77. Beginning with the year 1972, the number of freight cars is based on a revised series. (TRAIN).

merged—or were they? Some degree of uncertainty lasted for not hours but a few days before the full court dissolved the justice's order and the merger was, for-sure, a merger.

Technology

By two key standards—what was under development and what made it to the marketplace—1980 was a high-tech year for the railroad industry. In the freight-car field, development and testing of new truck designs continued with no letup, while several carbuilders began taking new looks at various materials other than steel for car construction; because of its light weight, long life and high residual value and despite its high initial cost, aluminum seemed poised for a comeback. Use of non-metallic materials was also getting some attention. In the motive power area, U.S. and Canadian builders were all out with new designs, in production or prototype models, all of these changes aimed at improving fuel efficiency, reliability and adhesion ratings. On the engineering side, suppliers continued to work on improved fastening systems and on new gains in the efficiency and reliability of track machines.

Intermodal systems, meanwhile, continued to have a fascination for R&D people, with about a dozen companies involved in design and/or testing of new intermodal vehicles. Among the major developments: The dual-mode RoadRailer made its debut in regular revenue service along the Eastern Seaboard; Budd tested an articulated, trailer/container well car between the East Coast and Chicago; Trailer Train continued to refine an articulated design which uses two-wheel trucks; and Santa Fe moved closer to construction of a container version of its articulated Ten-Pack trailer system.

Passenger service

For Amtrak, 1980 was a year of mixed blessings. Its Northeast Corridor improvement program was putting a high-speed line in place between Washington and Boston, new equipment was going into service to cut maintenance costs and make passengers happier, and there were more passengers to share in that happiness. Along with DOT, Amtrak looked at routes and came up with 13 deemed worthy of further study as potential high-density, high-speed corridors.

On the other hand, despite ridership increases, losses continued to be heavy, and there were indications that the incoming Administration might well regard Amtrak as a ready-made target for budget-cutters, despite the fuel-efficiencies which a well-patronized passenger train can demonstrate. One factor to consider here: Amtrak is a nationwide network, but of the total number of passengers served each year, the Northeast Corridor alone accounts for about one-half.

As for Auto-Train, it filed in September for reorganization under federal bankruptcy laws.

Various states supporting intrastate passenger services, meanwhile, seemed to regard them as worthwhile despite losses being incurred, and there was even consideration being given in a couple (notably Ohio and California) to creation of new high-speed corridor lines.

"High speed" in 1980, however, continued to be synonymous with what was happening on Amtrak's Northeast Corridor Improvement Project, and so far as

Capital expenditures and retained funds 1969-1980

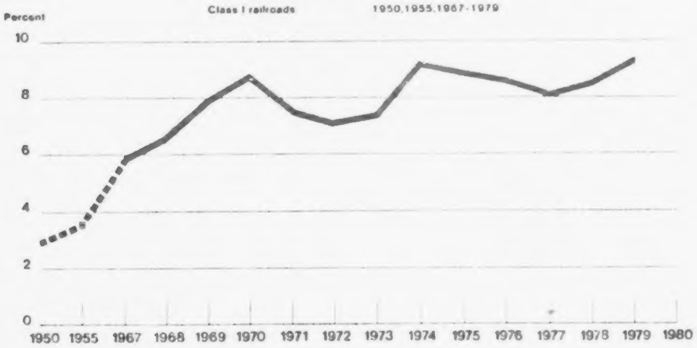
Year	Gross capital expenditures Rolling stock (millions)	Other facilities (millions)	Total (millions)	Retained funds* (millions)	Excess of capital expenditures over retained funds (millions)
1969	$1,089	$ 421	$1,509	$ 816	$ 694
1970	993	358	1,351	618	733
1971	864	314	1,178	784	394
1972	848	368	1,216	923	293
1973	893	449	1,342	964	378
1974	1,038	527	1,565	1,091	475
1975	1,303	486	1,790	622	1,168
1976	1,175	550	1,725	683	1,042
1977	1,540	751	2,291	763	1,527
1978	1,883	855	2,738	727	2,011
1979	2,285	1,039	3,323	1,390	1,933
12 mos. to 9/30/80	2,499	1,064	3,563	1,666*e*	1,897*e*

*Retained funds represent income before extraordinary items, plus deferred taxes and depreciation and retirement charges, less cash dividends and equity in undistributed earnings of affiliated companies.

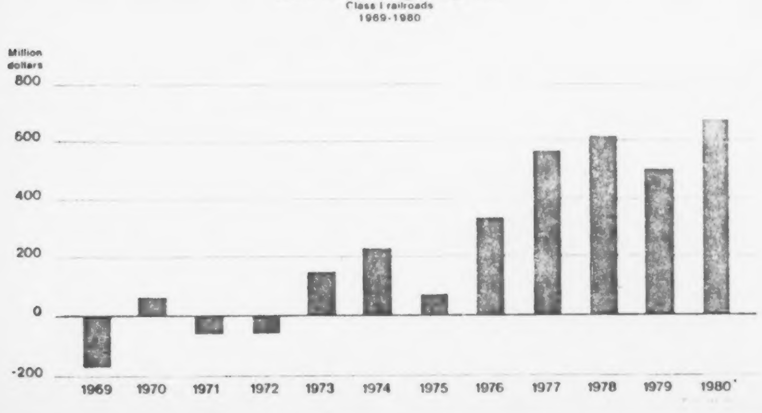
Note: Capital expenditures of Class I railroads do not include expenditures for railroad equipment made by private car companies and lessors.

e – Estimated

Average interest rates on equipment obligations issued



Net working Capital



track rehabilitation was concerned, many of the numbers were impressive. All major elements of rehab were at 50% of completion or better—with concrete-tie track-laying at 57%, ballast undercutting at 55%, and ballast cleaning at 62%—while such items as wood-tie replacements, laying of continuous welded rail and rail-joint elimination were in the 90% range.

Two so-called "section improvement" packages (intended to put segments of the line into configuration as parts of the high-speed route) were in effect, with contracting for eight additional packages scheduled for 1981.

Through the 1980 work season, Amtrak's timetable reflected the problems of operating a passenger railroad while trying to rebuild its fixed plant at the same time. One result of this was that "on time" performance figures looked considerably better than they had in the previous year—an average 70.3% on-time operation for fiscal year 1980 versus 60.6% for fiscal 1979. Then came late-October timetable changes, and for the first time Northeast Corridor schedules were shortened, with average cuts of seven minutes from Metroliner schedules, of nine minutes on conventional trains between New York and Washington, and of 10 minutes on Amfleet trains between New York and Boston.

Through an amendment to the 4R Act, Congress added $750 million to the original improvement program, and that was a boost toward actually getting the whole job done by its target date, September 1985—at which time, if not before, Amtrak would be able to drop that old familiar refrain from its NEC timetables: "Amtrak is undertaking major track rehabilitation.... Your understanding and patronage are appreciated as we work to bring you a better rail passenger service."

Amtrak's relationship with the railroads that operate its trains was the subject of a report, to the Congress by the General Accounting Office issued early in 1981. GAO recalled that Amtrak's most recent attempt to win legislation to strengthen its bargaining position with the operating carriers came in April 1980, when it submitted proposals that would:

—"Require penalties to be assessed against an operating railroad's base compensation if on-time performance at passenger stations designated by Amtrak fell below 75% before 1982, 80% in the period 1982-84, and 85% beginning in 1985. Amtrak and an operating railroad could contractually agree to alternate standards for performance penalties and could continue to contract for payment of incentives for high-quality performance.

—"Require the Federal Railroad Administration to carefully survey the current condition of rail lines used in Amtrak service, and authorize the administration to order rail lines restored to the condition of any higher level which may be specified by other legal requirements or by contract.

—"Authorize the Secretary of Transportation to order a railroad to operate additional Amtrak trains on existing or new routes. Compensation for such additional operations would be as provided by existing contracts, or as determined by the ICC under its existing jurisdiction if there were no applicable agreement.

—"Authorize the Secretary of Transportation to review state and local speed restrictions, and to revise or eliminate any such restriction which the secretary determines imposes an unreasonable burden on interstate commerce.

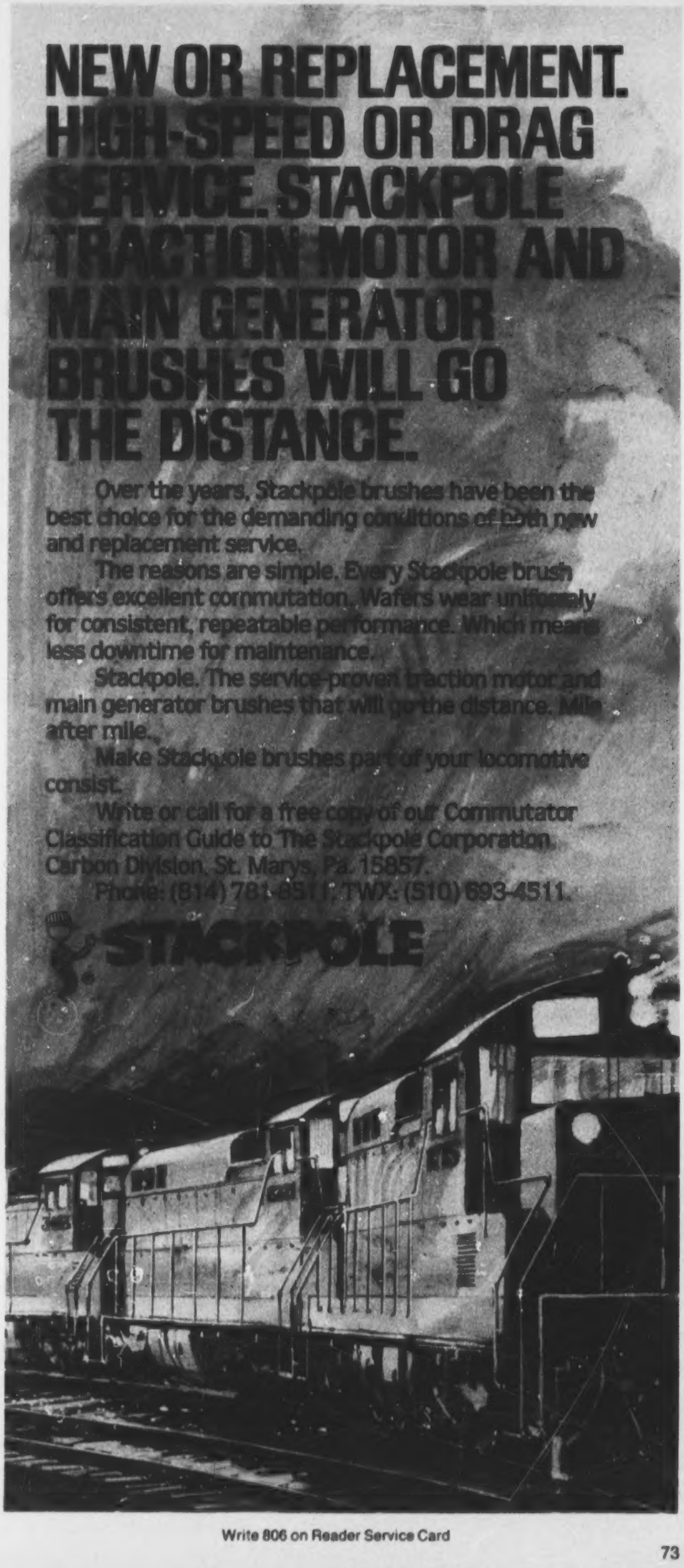
—"Entitle a railroad to receive an additional tax credit equal to 10% of the amount of its expenditures for improvement to its rail lines which Amtrak agrees in advance will significantly benefit Amtrak operations by permitting faster operations or improved reliability."

Nothing, so far, has come of these proposals.

GAO's own recommendation is that Amtrak "try to obtain needed improvements in passenger service contracts with other railroads by taking additional cases to ICC in which Amtrak is unable to obtain railroad agreement on incentives for meeting intermediate point schedules and penalties designed to encourage good performance and cost restraint."

With Amtrak under almost constant attack, some people have the impression that the experiment has been a dismal failure. One reason for this, believes President Alan S. Boyd, is that Amtrak has not been content to enbalm the past. Summing up the railroad's recent history, Boyd commented not long ago:

"We have been able to turn around the generation-long decline in rail passenger ridership, and we have been able to more than double corporate revenues. We have initiated computerized services, improved passenger service, introduced new equipment and rehabilitated the old. We have been able to prove that the government's investment in this industry has been wise, worthwhile, and sound for the long run. At the same time, we all know that we have a very long way to go and that many obstacles line our path. One of the greatest of these obstacles is the common misunderstanding of what rail passenger service ought to be today." ■



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Market

CARLOADINGS

Loadings of revenue freight in the week ended Jan. 3 totaled 338,261 cars, according to the Association of American Railroads. This was a decrease of 30,424 cars, or 8.3%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Jan. 3 are estimated at 14.2 billion, a decrease of 3.0% below the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity	**Jan. 3 week**	**Dec. 27 week**
Grain	27,541	20,730
Farm products	3,956	3,638
Metaillic ores	26,810	22,561
Coal	91,708	72,906
Crushed stone, gravel & sand	7,411	5,377
Nonmetallic minerals	12,432	11,043
Grain mill products	12,176	11,689
Food and kindred products	12,806	10,944
Primary forest products	14,102	8,707
Lumber & wood products (except furniture)	4,934	5,135
Pulp, paper & allied products	16,734	13,179
Chemicals & allied products	27,128	22,121
Petroleum products	5,204	4,272
Stone, clay & glass products	11,876	8,994
Coke	6,033	4,829
Metals & products	14,172	11,160
Motor vehicles & equipment	4,036	10,164
Waste & scrap materials	8,490	7,991
Forwarder & shipping assn. traffic	5,971	6,515
All other carloads	24,596	24,139
LCL traffic	145	142
Total cars loaded	**338,261**	**286,236**
	1981	1980
Estimated revenue ton-miles (billions), 1 week	**14.2**	**14.7**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Dec. 27, 1980, totaled 21,525 cars (4.8% below the corresponding 1979 week) and 38,006 trailers or containers (down 2.9% from 1979). Cumulative volume for 1980 is 1,661,110 (down 10.6% from 1979) and 3,014,864 trailers or containers (down 8.0% from 1979).

- *Indian Railways.*—Hindustan Machine Tools, Ltd. of India has awarded an $11.8-million contract to Emhart Corp. of Farmington, Conn., for railroad wheel and axle machinery to be installed in a new Indian Railways shop at Yelahanka, near Bangalore. Emhart's Farrel units in Rochester, N.Y., and Ansonia, Conn., will share responsibility for the contract. Scheduled for completion in 1982, the new shop will be capable of producing 100 assembled wheel and axle sets per shift.

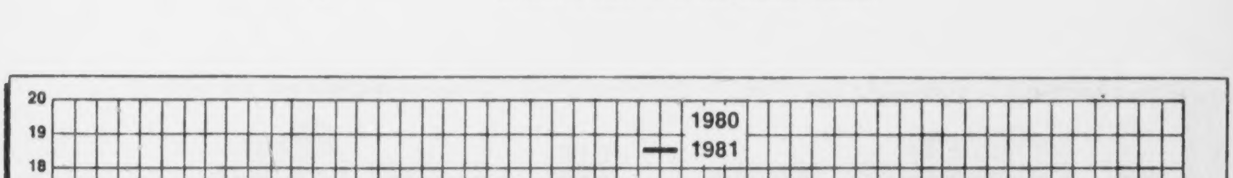
- *Ohio Rail Transportation Authority*—Awarded a $1,199,085 contract to Dalton, Dalton, Newport of Cleveland for preliminary engineering work for a 20-mile high-speed rail passenger test track that is to be built between Warren and Ashtabula in northeastern Ohio.

- *Santa Fe.*—Delivery of 16 3,600-hp B36-7 diesel-electric units built by General Electric has now been completed. GE claims that, based on today's diesel fuel prices, the B36-7 offers fuel savings of more than $200,000 over the anticipated life of the locomotive. Contributing to the fuel saving, says GE, are lower engine idle speed, decreased radiator fan horsepower, a modulated dynamic braking system, and an improved turbocharger.

- *CN Rail.*—Will purchase 1.1 million ties from Con-Force Costain Concrete Tie Co. of Edmonton over the next five years, at a cost estimated between $35 million and $40 million. This is an extension of a five-year contract awarded to Con-Force Costain in 1975; that agreement called for 1.5 million ties valued at approximately $40 million.

- *Bangladesh Railways.*—Awarded a $5.1-million contract to Canadian Pacific Consulting Services Ltd. for assistance in strengthening its locomotive maintenance capacity and modernizing its material management system. The five-year project is funded by the Canadian International Development Agency.

- *Irish State Railway (C.I.E.)*—Awarded a $17-million signaling contract to WABCO Westinghouse International Co., an affiliate of Union Switch & Signal. WABCO Westinghouse Ltd. in Trales, Ireland, will furnish components and services for the contract. The contract includes engineering and design of a system to enable C.I.E. to convert from semaphore and manual signaling to a computerized control system by mid-1982. The project involves 20 miles of track, running from Howth, north of Dublin, to Bray in the south. It includes a wayside oriented system with double-direction running. WABCO Westinghouse will provide automatic train control for C.I.E.'s new m-u commuter trains.



RAIL FREIGHT TRAFFIC TRENDS

BILLION TON MILES (Estimated)

Source: Association of American Railroads

Week ended Jan. 3, 1981

14.2 BILLION

NOTE

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A year of change—and challenge

February 9, 1981

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February 9, 1981 • Vol. 182, No. 3

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Published semi-monthly by the Simmons-Boardman Publishing Corporation, 508 Birch St., Bristol, Conn. 06010. Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $10 one year, $16 two years; all other countries $25 one year. All other subsubscribers in the U.S., Canada, and Mexico: $20 one year; all other countries: $35 one year. All subscriptions payable in advance. Single copies $1 plus postage and handling, except special issues. Copyrighted © 1981.

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Change of address should reach us three weeks in advance of next issue date. Send old address with new enclosing, if possible, your address label. Post Office will not forward copies unless you provide extra postage.

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Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA. 18301. Controlled circulation postage paid at East Stroudsburg, PA., and at Bristol, CT.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010

Inside

LUTHER S. MILLER

A RAILCAR BONANZA

There is considerable gloom in the supply community these days, the reason being that many freight railroads are cutting back sharply on equipment purchases. While capital spending this year will be in the respectable neighborhood of $4-billion plus, it will not approach the giddy levels of 1979 and 1980, when non-railroad investors were pouring a king's ransom into get-rich-quick freight-car schemes. But there is one important segment of the railroad market, largely ignored by analysts, that is not subject to the vagaries of the freight business and is, in fact, booming in these recessionary times. That is the passenger railcar business.

According to a *Railway Age* survey, orders will be placed this year for between 1,100 and 1,200 new passenger railcars, about $1 billion worth of business for the prime contractors and their component suppliers. The action has already started. A few days ago New York's Metropolitan Transportation Authority was to open bids for 130 commuter cars. A few weeks from now, the New York City Transit Authority, will advertise 300 new IRT rapid transit cars for bid (p. 8). (The money for those cars, by the way, is safely in pocket—$190 million raised through a 1979 bond authorization—and therefore is not subject to whatever the Reagan administration does or doesn't do with respect to public transit funding.)

Meanwhile, the builders and the component manufacturers are working on a healthy backlog of more than 1,500 cars (*RA*, Jan. 12, p. 16).

The long-range outlook is one of solid optimism. Purchasing authorities in the U.S. and Canada already have firm plans for purchasing between 2,600 and 3,600 cars during the five-year 1982-1986 period.

All of this is good news for railcar builders around the world, who in recent years have found one of their biggest markets in the U.S. But the news isn't entirely good for U.S. suppliers.

BUT FOR WHOM?

The fact is, U.S. prime contractors now have less than half of the U.S. passenger railcar business. Of the 11 carbuilders with orders on their books on Jan. 1, only three were U.S.—Budd, Pullman Standard, and General Electric. Pullman will disappear from the list when it completes delivery of the cars it still owes Amtrak. General Electric's future participation will consist mainly of assembling cars for foreign contractors. This leaves Budd—and while Budd is in an extremely healthy position, with $400 million worth of business on its books and more in prospect, Budd isn't happy about the flight of U.S. business to foreign builders. Budd's position is outlined in this issue's cover story by Associate Editor Frank Malone (p. 14). "It's not protectionism we want," insists Budd President and Chief Executive Officer James H. McNeal, "it's a redress of the inherent injustices in a bidding process that permits hidden subsidies to kill off American jobs and to waste American tax dollars."

Whether or not Budd succeeds in stemming the foreign invasion, U.S. component suppliers will still get a large share of the business, because that's mandated by the Buy America law, as is U.S. assembly of all cars ordered abroad.

A further boon to U.S. suppliers is the fact that NYCTA, stung by its experience with new technology in the R-46 is specifying the tried-and-true for its new cars. And that, in many cases, will mean home-made components.

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FEATURES

14 Budd: Very much alive—and kicking
A few years ago U.S. passenger railcar builders began to go out of the business, and foreign builders moved in. Budd, the sole U.S. survivor, has a big order backlog—but also has a big gripe about the foreign invasion.

18 RPI's L. L. White: A year of change—and challenge
The chairman of the Railway Progress Institute gives his views on the changing Washington scene—and outlines the supply group's strategy for helping to promote the general well-being of the railroad industry.

21 "Project 21"—Double track and six feet wide
Inventor Larry K. Edwards' inclined durorail, steel-wheel system is designed with an eye toward "an elevated but narrow profile...along with a reasonably practical turnout." He described it at a recent TRB meeting.

24 SP: Getting through to Mexico
The ultimate solution to the freight-car congestion at border crossing points probably lies in a sophisticated computer network. But SP has found immediate benefits in a "people to people" communications program.

34 Does utilization matter during a period of car surplus?
Peter French, manager of AAR's Freight Car Utilization program, argues: "There are almost as many reasons to be concerned about effective car management in periods of car surplus as during periods of car shortage."

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8 Pullman closes two car plants
9 Amtrak continues to gain riders
9 Conrail files new surcharges
9 CSX roads extend piggyback service
12 Waukesha to build Sulzer engines

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COVER: New CTA car on test track at Budd's Philadelphia plant.

Market

CARLOADINGS

Loadings of revenue freight in the week ended Jan. 17 totaled 419,854 cars, according to the Association of American Railroads. This was a decrease of 23,779 cars, or 5.4%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Jan. 17 are estimated at 17.6 billion, an increase of 1.3% above the corresponding week of 1980.

Commodity	Jan. 17 week	Jan. 10 week
Grain	35.408	35.925
Farm products	5.292	4.751
Metallic ores	26.110	28.848
Coal	103.206	102.095
Crushed stone, gravel & sand	10.030	10.429
Nonmetallic minerals	12.885	14.062
Grain mill products	15.837	16.313
Food and kindred products	16.947	16.065
Primary forest products	19.958	20.001
Lumber & wood products (except furniture)	8.339	7.574
Pulp, paper & allied products	20.499	19.484
Chemicals & allied products	26.605	27.905
Petroleum products	5.915	6.026
Stone, clay & glass products	12.987	13.565
Coke	5.684	5.627
Metals & products	14.971	14.172
Motor vehicles & equipment	16.665	13.198
Waste & scrap materials	13.396	11.648
Forwarder & shipping assn. traffic	9.174	8.158
All other carloads	39.715	36.087
LCL traffic	230	209
Total cars loaded	**419,854**	**412,142**
Cumulative total,	1981	1980
3 weeks	**1,170,444**	**1,250,644**
Estimated revenue ton-miles (billions), 3 weeks	**49.2**	**49.3**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Jan. 10 totaled 28,072 cars (12.3% below the corresponding 1980 week) and 50,080 trailers or containers (down 14.8% from 1980). Cumulative volume for the first two weeks of 1981 is 48,593 (down 12.5% from 1980) and 87,122 trailers or containers (down 13.0% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the ten-day period ended Dec. 31, 1980, totaled 4.27 million tons (down 9.2% from 1980). Cars loaded totaled 63,419 (down 0.9% from 1980). Cumulative loadings for 1980 were up to 259.6 million tons (down 0.8% from 1979).

- *Grand Trunk Western.*—Plant improvement program for 1981 will include construction of an 18-track yard at Orion, Mich.; installation of 59.7 miles of welded rail and 200,000 crossties, along with surfacing of 325 miles of track; and installation of 11.7 miles of microwave and 15 rail/highway crossing warning devices. Only new freight equipment in GTW's overall $13.1-million capital budget will be 100 50-ft XM box cars.

- *Southern.*—Asked the ICC for permission to offer for competitive bidding $27.75 million of equipment trust certificates to finance the purchase of 500 100-ton, 4,750-cu-ft-capacity covered hopper cars; 300 100-ton, 3,000-cu-ft-capacity covered hopper cars; and 128 70-ton pulpwood cars.

- *Union Pacific.*—Awarded $25 million of equipment trust certificates to Morgan Stanley & Co. and Warburg Paribas Becker; annual net interest cost for the railroad is 13.317%. The issue will cover 80% of the cost of 20 3,000-hp diesel electric units, 100 100-ton boxcars and 215 100-ton open top hoppers.

- *Freight cars and locomotives.*—The following report has been received from the AAR and the ARCI:

DELIVERED

	November		October	Eleven months	
	1980	1979	1980	1980	1979
Built new by carbuilders	4,574	7,971	6,956	75,206	75,976
Built new in RR shops	371	913	412	5,184	5,382
Built new—total	4,945	8,884	7,368	80,390	81,358
Rebuilt	7	54	21	1,150	866
TOTAL DELIVERED	**4,952**	**8,938**	**7,389**	**81,540**	**82,224**
Locomotives (new and rebuilt)	86	168	101	1,575	1,732

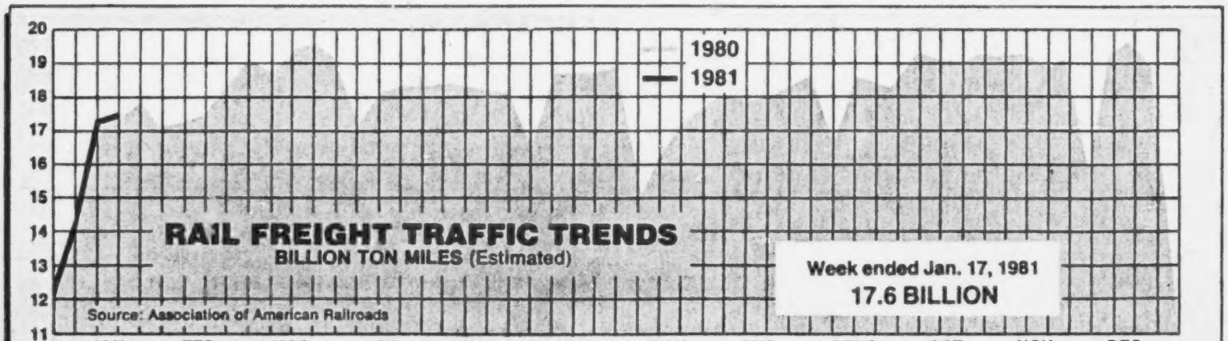
ORDERED

	November		October	Eleven months	
	1980	1979	1980	1980	1979
To be built new by carbuilders	3,230	7,890	1,847	35,840	101,351
To be built new in RR shops	700	568	200	5,250	5,031
To be built new—total	3,930	8,458	2,047	41,090	106,382
To be rebuilt	0	54	0	1,063	879
TOTAL ORDERED	**3,930**	**8,512**	**2,047**	**42,153**	**107,261**

ON ORDER AND UNDELIVERED

	December 1		November 1	Average backlog	
	1980	1979	1980	1980	1979
To be built new by carbuilders	51,337	113,797	53,389	76,415	113,750
To be built new in RR shops	6,318	5,960	5,989	6,475	6,323
To be built new—total	57,655	119,757	59,378	82,890	120,073
To be rebuilt	13	100	20	264	102
TOTAL ON ORDER	**57,668***	**119,857**	**59,398**	**83,154**	**120,175**
Locomotives (new and rebuilt)	472	656	496	834	969

*Due to revisions and cancellations of some orders, the backlog has been reduced by 708 cars.



New York's agony
—and a man with a plan

February 23, 1981

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RAILWAY AGE

USPS 449-130

February 23, 1981 • Vol. 182, No. 4

Editorial and Executive Offices
New York, N.Y. 10014, 345 Hudson Street
212/620-7200

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

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POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010

Inside

LUTHER S. MILLER

THE STOCKMAN REPORT

Poor folks everywhere can rejoice that the new administration in Washington, contrary to rumor, is not going to try to balance the budget by eliminating schoolchildren's lunches or raiding old people's pensions. But no such reassurance has been given to the poor folks who ride Amtrak's trains. In fact, there are increasing signs that Amtrak is regarded as something of a sitting duck for the sharpshooters at the Office of Management and Budget.

No final decisions have been made, and none *will* be made without a brisk fight on Capitol Hill, where Amtrak has a scrappy if small constituency of true believers. But OMB Director David Stockman, a powerful figure in the new government, has made his own position on passenger trains chillingly clear (p. 14). He believes that they are no more essential than the riverboats of yore. "It is inappropriate," says Mr. Stockman, "for the federal government to subsidize travel between two points when the private sector offers common carrier bus and air travel services."

(Does Mr. Stockman believe that the highways the buses roll on, and the air traffic control systems the airlines fly in, are unsubsidized?)

Mr. Stockman has not proposed killing Amtrak, but he *has* proposed raising fares by 50% to 100% or more, and reducing Amtrak's capital budget by about $125 million a year, which would amount to the same thing.

Doubtless there are many who would regard this as a mercy killing. We are not among them. Amputate where necessary, yes; but don't cut out the patient's heart.

(Mr. Stockman is, at least, consistent in his attitude towards trains. Last year he refused to endorse Amtrak's Detroit-Chicago route as an "emerging corridor" although that route runs through his district.)

At about the same time the Stockman report was landing on editors' desks, another important piece of passenger-train news was breaking. The French government announced, with considerable pride, that 165-mph passenger trains would start operating on a new line between Paris and Lyon next Sept. 27. The new line represents an enormous investment in francs; it also represents, as France sees it, an important investment in the future of transportation. The new line will prove, claims French National Railroads, "that highly fuel-efficient railroads can adapt to modern age technology and provide valid alternatives to other means of transportation."

Something is screwy somewhere. And not, we believe, in Paris.

PEOPLE, PROPERTIES, AND THE NEW BN

"Era of the Giants" is the title of a new series of articles that begins in this issue of *Railway Age*; it is singularly appropriate to kick off the series with the merged Burlington Northern/Frisco. The new BN is big: If the railroads of Britain, Sweden, and Italy were somehow put together, the resulting network would be only a smidgen bigger than this biggest of all U.S. railroads. BN now has a single through route of more than 3,000 miles, Portland to Birmingham.

But as the Penn Central demonstrated so convincingly a few years ago, big is not necessarily better, or even as good. What makes BN loom so big in the future of this country's transportation is not giantism alone, but the fact that it represents, in Senior Editor Gus Welty's words, "a good fit in terms of properties and personalities." How the two are meshing is the subject of Gus's cover story (p. 18).

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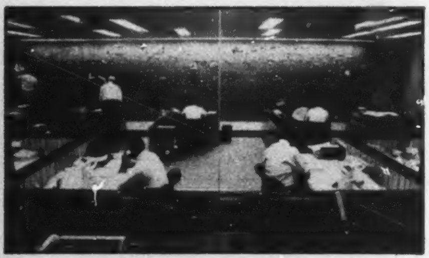

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THE ERA OF THE GIANTS *BN/Frisco*

18 **A good fit of properties and personalities**
The new BN has big problems, but also some big advantages: It's the product of a true-end-to-end merger, with little duplication of facilities or routes, and its managers are not strangers to each other.

25 **Operations: Family Lines puts it all together**
All operations control functions of the lines that make up the system are now centralized at Jacksonville, Fla. "It's really great to have a visual abstract of the entire situation," says one officer.

38 **Marketing: Do railroads really know what it's all about?**
There are two or three exceptionally strong marketing departments, and there have been some well publicized marketing successes. But the industry still has a long way to go before actions live up to rhetoric.

42 **Railview: "One word says it all. Innovate!"**
Deregulation means service innovations—and that, in turn, means railroads and carbuilders will be working in relationships that "put heavy premiums on engineering and creativity," writes ACF's Henry Correa.

44 **New York's transit agony—and a man with a plan**
NYCTA President John D. Simpson believes that only massive capital investment can pull the city's subways out of their present crisis—and he is exploring some unusual ways of financing it.

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COVER: Photo symbolizes the coming together late in 1980 of BN and Frisco.

Market

CARLOADINGS

Loadings of revenue freight in the week ended Jan. 31 totaled 443,161 cars, according to the Association of American Railroads. This was an increase of 8,230 cars, or 1.9%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Jan. 31 are estimated at 18.3 billion, an increase of 7.0% above the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity	**Jan. 31 week**	**Jan. 24 week**
Grain	31,706	34,547
Farm products	4,087	4,331
Metallic ores	25,483	25,834
Coal	118,145	111,716
Crushed stone, gravel & sand	10,903	10,506
Nonmetallic minerals	12,489	13,376
Grain mill products	16,640	16,822
Food and kindred products	17,184	17,490
Primary forest products	19,936	19,917
Lumber & wood products (except furniture)	9,613	9,078
Pulp, paper & allied products	21,489	21,243
Chemicals & allied products	28,835	28,236
Petroleum products	6,447	6,623
Stone, clay & glass products	13,666	13,894
Coke	6,229	6,120
Metals & products	16,890	16,290
Motor vehicles & equipment	16,872	15,997
Waste & scrap materials	12,922	13,245
Forwarder & shipping assn. traffic	10,924	10,404
All other carloads	42,357	40,871
LCL traffic	344	329
Total cars loaded	**443,161**	**436,869**
Cumulative total	1981	1980
5 weeks	**2,050,457**	**2,134,932**
Estimated revenue ton-miles (billions), 5 weeks	**85.7**	**84.2**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Jan. 24 totaled 32,281 cars (6.4% below the corresponding 1980 week) and 57,967 trailers or containers (down 7.1% from 1980). Cumulative volume for the first 4 weeks of 1981 is 111,641 cars (down 10.2% from 1980) and 201,038 trailers or containers (down 10.6% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Jan. 7, 1981 totaled 3.6 million tons (up 4.2% from 1980). Cars loaded totaled 53,405 (up 8.1% from 1980).

- *CP Rail.*—Ordered 50 100-ton, 52-ft, 6-in. covered coil gondola cars from National Steel Car at a cost of $4 million for delivery in June and July.

- *Milwaukee Road.*—Is taking delivery of 500 new gondolas acquired under long-term lease from PACCAR. Lessor is Railease, Inc., a joint venture of PACCAR and Brae Corp. To be completed by March, deliveries represent Milwaukee's first major acquisition of gondolas since 1975. The 100-ton mill gons are part of a plan to tailor services for customers in the slimmed-down "Milwaukee II" territory.

- *Seaboard Coast Line.*—Awarded a $9-million contract to Dravo Wellman Co. for expansion of a phosphate transfer terminal at Tampa, Fla. Dravo Wellman is a Cleveland-based subsidiary of Dravo Corp. of Pittsburgh.

- *Freight cars and locomotives.*—The following report has been received rom the AAR and the ARCI:

DELIVERED

	December		**November**	**Twelve months**	
	1980	**1979**	**1980**	**1980**	**1979**
Built new by carbuilders	5,151	7,376	4,574	80,357	83,931
Built new in RR shops	379	708	371	5,563	6,090
Built new—total	5,530	8,084	4,945	85,920	90,021
Rebuilt	13	16	7	1,163	882
TOTAL DELIVERED	**5,543**	**8,100**	**4,952**	**87,083**	**90,903**
Locomotives (new and rebuilt)	149	160	86	1,724	1,892

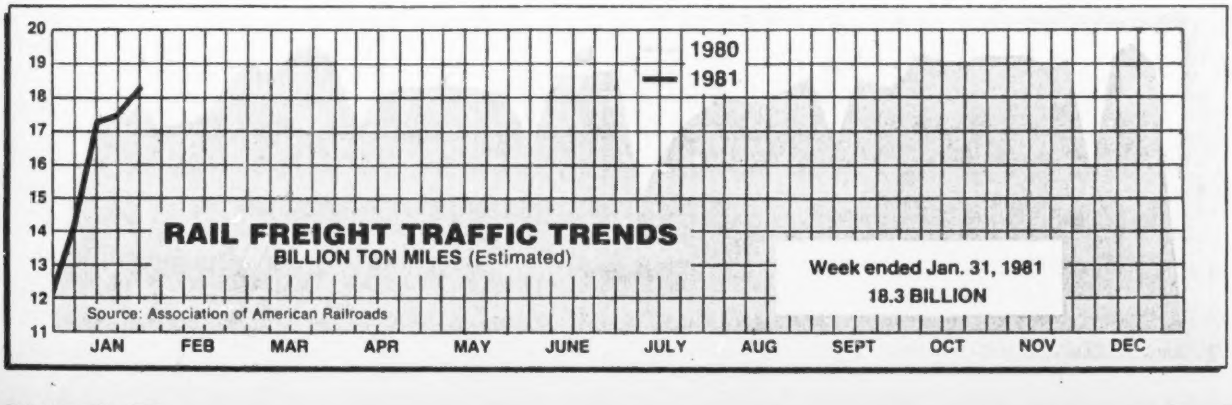
ORDERED

	December		**November**	**Twelve months**	
	1980	**1979**	**1980**	**1980**	**1979**
To be built new by carbuilders	4,722	7,538	3,230	40,140	113,060
To be built new in RR shops	0	1,000	700	5,250	6,031
To be built new—total	4,722	8,538	3,930	45,390	119,091
To be rebuilt	0	16	0	1,063	895
TOTAL ORDERED	**4,722**	**8,554**	**3,930**	**46,453**	**119,986**

ON ORDER AND UNDELIVERED

	January 1		**December 1**	**Average backlog**	
	1981	**1980**	**1980**	**1980**	**1979**
To be built new by carbuilders	47,866	112,749	51,337	74,036	113,667
To be built new in RR shops	5,939	6,252	6,318	6,431	6,317
To be built new—total	53,805	119,001	57,655	80,467	119,984
To be rebuilt	0	100	13	242	102
TOTAL ON ORDER	**53,805***	**119,101**	**57,668**	**80,709**	**120,086**
Locomotives (new and rebuilt)	665	1,460	472	820	1,010

*Due to revisions and cancellations of some orders, the backlog has been reduced by 3,042 cars.



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RAILWAY AGE

USPS 449-130

March 9, 1981 • Vol. 182, No. 5

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212/620-7200

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Inside

LUTHER S. MILLER

REAGAN PRO AND REAGAN CON

President Reagan's efforts to repeal two or three decades of the 20th century are enjoying widespread public support. Everybody wants to go back to the good old days of zero inflation and mind-your-own business. Well, nearly everybody. The fact is that while people don't mind seeing someone else's ox gored, they are jealously protective of their own. We are, perhaps, no exception. While we applaud the government's determination to hack away at subsidies that give the freight railroads' competitors an unfair (and unearned) advantage, we are less happy with the dictum that henceforth public transit must be a pay-as-you-ride operation. But there is, we believe, no real inconsistency here.

It has not been demonstrated that a healthy freight transportation system requires that certain carriers be permitted to swill from the public trough, as the highway and waterway carriers have done for so many years. (We will claim a temporary exception for Conrail, since so many of Conrail's problems can be traced to the inequities of subsidized highway competition.)

It has, on the other hand, been amply demonstrated that public transportation in large cities cannot pay for itself and still provide the levels of service required to keep people out of their automobiles. There is little argument to be found anywhere these days, except at the Reagan White House, that transit is an *essential* service, much like a fire department or a sewage system, some of whose costs must be borne by all for the common good. That is not the way it ought to be, but that is the way it is; to pretend that it is otherwise could have far-reaching consequences. The Regional Plan Association of New York, New Jersey and Connecticut estimates that eliminating federal operating subsidies for transit could send 900 million transit riders back to their autos—and that, in turn, could have the effect of increasing our purchases of overseas crude oil by as much as $650 million a year (see p. 25).

"Very disturbing" is what APTA Executive Director Jack Gilstrap calls the administration's get-tough-with-transit program. "It's very possible," he adds, "that when the new people begin to study the problems we'll see a more realistic view."

It is even possible that a restudy will suggest less-sensitive areas where cuts can be made—for example, the $1-billion-plus four-mile highway for New York City that remains in the budget. It is that kind of political aberration that takes some of the gloss from the shining armor of those knights at the OMB.

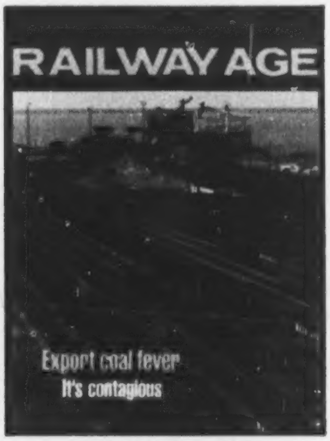
EXPORT COAL—AND THE IRONY OF IT ALL

It is always a pleasure to record the news that railroads are winning new freight traffic; we do so in this issue in our cover story on the export coal boom (p. 26). But there is an ironic twist to this story that we hope is not lost on Washington. As Chessie's Jerry Golbrecht puts it: "We are hauling solid trainloads of steam coal right past American power plants that are still burning that expensive imported oil, with those trains on their way to ports where the coal will be dumped into ships bound for overseas utility plants." Rigid and often unrealistic environmental restrictions are, of course, responsible for this paradox. Making it possible for our trains to haul some of our coal to our own utilities ought to be a priority item for the new administration.

RAILWAY AGE

March 9, 1981

FEATURES



Cover article, page 26

24 The Reagan budget: A mixed bag for rail interests
Conrail, branch lines, Amtrak, and rail transit all face big cuts in federal support; but a proposal to increase waterway user charges, if enacted, would mean achievement of a long-standing goal for freight railroads.

26 Export coal fever: It's contagious
Europe and Japan are providing hungry markets for U.S. coal, both steam and metallurgical, and ports on four coasts are gearing up to meet the demand. But there is some question as to just how big the boom will turn out to be.

32 New M/W technology evolves at Pueblo
Eight of 23 projected m/w experiments have now been completed on the FAST track, and a survey by *Railway Age* shows that a number of suppliers have taken advantage of the early findings to make improvements in their products.

42 Bailey West: Computer control from crest to coupling
Movement of cars into the bowl is controlled by an integrated real-time Process Control Sysem (PCS); the PCS computer communicates with UP's Terminal Information Systems, which maintains car inventory and status data.

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6 Short and Significant
13 Contract shops: A question of quality
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16 Unions get carrier notices
20 Big Amtrak order goes to Honeywell
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COVER: A busy day at Chessie's Newport News, Va., export coal facility.

REVENUES AND EXPENSES OF RAILWAYS

BEST AVAILABLE COPY

Third quarter figures of calendar year 1980

(Dollar figures are stated in thouands: i.e., with last three digits omitted)

		Operating revenues				Operating expenses														
						Way & structures			Equipment											
		Freight	Other	Total 1980	Total 1979	Total 1980	Total 1979	Deprec.	Total 1980	Total 1979	Deprec.	Total 1980	Total 1979	Operating Ratio 1980	Operating Ratio 1979	Income after fixed charges 1980	Income after fixed charges 1979	Net Ry. operating income	Net income 1980	Net income 1979
Amtrak	3 mos.	–	275,206	275,206*	254,832*	31,694	18,282	6,015	96,548	79,910	13,896	325,700	270,942	118.34	106.32	(57,192)	(25,061)	(50,483)	(57,192)	(25,061)
	9 mos.	–	809,986	809,986*	735,497*	64,283	51,540	7,352	262,575	209,574	39,796	875,717	750,377	108.11	102.02	(88,521)	(39,977)	(65,729)	(88,521)	(39,977)
Atchison, Topeka & Santa Fe	3 mos.	559,793	10,603	570,396	483,935	92,359	83,833	3,321	116,521	107,611	20,254	501,132	450,777	87.9	93.1	64,629	29,780	54,268	49,380	23,688
	9 mos.	1,577,289	34,779	1,612,068	1,350,065	270,989	232,800	9,680	345,589	293,813	58,778	1,477,501	1,234,387	91.7	91.4	118,778	107,467	–	91,964	84,947
Baltimore & Ohio	3 mos.	212,691	7,191	219,882	226,479	53,240	49,610	1,714	45,792	50,274	6,948	216,719	219,098	98.6	96.7	(2,079)	9,209	–	(2,597)	10,448
	9 mos.	666,234	25,111	691,346	678,915	138,947	122,380	5,105	156,085	160,495	20,649	660,134	638,307	95.5	94.0	21,236	39,401	30,961	20,143	35,034
Bessemer & Lake Erie	3 mos.	28,121	3,252	31,374	37,650	2,952	4,193	676	3,211	5,746	1,265	17,075	22,557	54.42	59.91	560	604	7,102	7,243	8,349
	9 mos.	74,445	8,836	83,281	89,712	11,188	9,916	2,042	12,483	16,120	3,616	57,153	59,451	68.62	66.26	1,678	1,902	12,584	14,991	16,471
Boston & Maine	3 mos.	26,764	1,916	28,680	27,094	6,094	5,491	272	7,418	8,260	361	28,727	28,852	100.16	106.48	592	(892)	13,285	(1,740)	(3,675)
	9 mos.	79,929	5,777	85,706	80,641	16,306	15,393	823	21,992	23,119	1,567	85,222	81,707	99.43	101.32	2,128	586	663	(5,727)	22,422
Burlington Northern	3 mos.	756,364	23,438	779,802	643,117	174,073	163,393	5,348	163,732	147,415	17,122	729,932	646,610	93.60	100.54	60,538	10,833	29,262	39,919	16,424
	9 mos.	2,081,439	69,366	2,150,805	1,758,325	418,957	370,836	15,826	459,236	407,881	49,921	1,988,519	1,687,717	92.45	95.98	197,270	110,281	122,969	157,911	125,443
Chesapeake & Ohio	3 mos.	216,572	12,337	228,909	203,646	44,116	38,359	1,480	40,015	44,083	3,565	201,470	189,502	88.0	93.0	23,414	29,543	–	13,185	22,333
	9 mos.	658,948	34,515	693,464	586,370	125,122	102,777	4,404	141,456	134,920	10,531	612,275	549,024	88.3	93.6	106,608	80,537	52,098	77,349	69,517
Chicago & North Western	3 mos.	221,260	22,682	243,943	196,865	53,129	42,001	1,033	63,013	51,728	3,722	237,183	196,103	97.22	99.61	1,245	(5,103)	7,970	1,208	(4,689)
	9 mos.	608,397	67,000	675,397	537,536	141,070	115,599	2,852	174,068	157,100	12,767	668,865	565,080	99.03	105.12	(7,967)	(43,107)	8,902	(8,077)	(41,867)
Chicago, Milwaukee, St. Paul & Pac.	3 mos.	79,526	12,474	92,001	118,735	47,765	31,177	543	27,193	39,950	4,747	136,674	147,160	148.6	123.9	(46,101)	(24,343)	(45,447)	(50,642)	(24,343)
	9 mos.	246,330	38,054	284,384	329,161	199,235	75,173	1,957	105,502	130,925	14,394	504,630	424,657	177.4	129.0	(145,825)	(83,396)	(221,370)	(171,014)	(83,396)
Clinchfield	3 mos.	22,566	325	22,891	16,575	3,819	3,018	108	3,161	2,646	924	15,958	12,535	69.7	75.6	4	(9)	7,451	–	–
	9 mos.	65,222	948	66,170	46,926	11,184	10,111	322	9,842	9,401	2,767	47,326	39,736	71.5	84.7	9	162	–	–	–
Colorado & Southern	3 mos.	32,080	610	32,691	22,543	11,901	9,648	61	7,768	5,288	710	35,695	28,758	109.19	127.56	702	(2,380)	(2,448)	1,259	(1,298)
	9 mos.	91,381	4,294	93,386	63,530	22,599	18,525	178	21,499	15,109	2,131	92,145	68,066	98.67	107.13	13,797	6,526	2,913	15,469	8,789
Conrail	3 mos.	728,210	164,058	892,268	937,120	216,610	241,303	3,023	257,292	277,828	24,388	1,030,419	1,097,589	115.48	117.12	(148,407)	(161,530)	(137,015)	(147,411)	(161,173)
	9 mos.	2,322,135	482,601	2,804,736	2,790,557	575,060	638,663	9,343	808,394	831,359	69,437	3,129,410	3,162,218	111.57	113.31	(342,993)	(366,416)	(321,927)	(340,682)	(365,180)
Delaware & Hudson	3 mos.	25,945	2,069	28,014	26,122	6,795	4,533	154	7,820	8,735	374	30,605	26,663	109.2	109.7	(3,316)	(3,310)	(2,534)	(3,316)	(3,310)
	9 mos.	83,554	3,109	86,662	73,759	15, 996	12,811	461	25,193	24,430	1,116	89,857	79,484	103.7	107.8	(5,223)	(7,524)	–	(5,223)	(7,524)
Denver & Rio Grande Western	3 mos.	70,068	2,260	72,328	65,255	11,970	12,400	614	10,701	9,881	2,912	59,347	56,836	82.05	87.09	11,742	8,107	8,219	6,945	6,058
	9 mos.	203,201	5,210	208,411	189,753	35,232	35,663	1,818	32,310	29,850	8,572	177,696	160,135	85.26	84.39	26,761	29,834	20,806	16,748	19,993
Detroit, Toledo & Ironton	3 mos.	14,238	793	15,030	19,379	3,201	3,658	177	5,610	6,489	468	18,870	21,334	125.5	110.1	(3,794)	(1,900)	(3,828)	(3,794)	(1,900)
	9 mos.	50,836	2,821	53,657	63,443	8,612	10,248	525	17,423	17,896	1,406	58,284	60,347	108.6	95.1	(4,989)	2,972	(4,374)	(4,771)	2,972
Duluth, Missabe & Iron Range	3 mos.	26,028	1,412	27,440	32,083	6,252	7,707	825	3,161	2,890	691	19,624	21,375	71.51	66.62	8,488	11,388	3,775	4,382	5,949
	9 mos.	69,442	3,296	72,737	74,350	19,263	18,483	2,717	6,378	8,511	2,061	55,311	57,081	76.04	76.77	20,036	18,585	8,014	10,527	9,190
Elgin, Joliet & Eastern	3 mos.	13,310	8,071	21,381	34,897	3,318	4,253	184	2,368	5,762	1,790	20,263	28,214	94.8	80.9	2,716	8,069	44,948	1,643	4,281
	9 mos.	50,856	31,610	82,465	111,564	10,713	11,977	545	11,628	18,120	3,885	72,800	85,002	88.3	76.2	15,930	30,283	2,528	8,794	16,091
Florida East Coast	3 mos.	22,550	680	23,231	18,708	5,070	4,434	249	4,709	2,994	1,034	18,340	15,539	78.9	83.1	7,951	4,132	8,580	5,114	2,788
	9 mos.	67,007	2,109	69,116	56,116	14,195	12,430	702	11,943	8,005	3,044	52,750	44,394	79.1	79.1	22,185	36,541	–	14,400	25,583
Ft. Worth & Denver	3 mos.	34,111	1,240	35,351	23,717	5,873	3,930	76	9,213	4,641	132	30,552	19,848	86.42	83.68	5,411	4,102	3,216	3,828	3,390
	9 mos.	99,502	2,818	102,321	66,913	16,235	9,516	215	25,349	15,681	396	86,231	54,296	84.27	81.14	16,397	12,917	10,479	10,786	10,638
Grand Trunk Western	3 mos.	38,932	2,267	41,199	50,636	9,011	8,651	419	9,587	12,373	1,365	48,555	54,045	117.9	106.7	(8,189)	(3,200)	(6,050)	(6,887)	(3,200)
	9 mos.	131,810	9,438	141,248	159,616	21,897	21,856	1,246	32,298	43,076	4,032	148,355	159,529	105.0	99.9	(7,396)	1,241	(4,176)	(4,471)	1,241

Illinois Central Gulf	3 mos.	209,115	21,643	230,758	212,194	53,368	47,753	1,741	69,200	60,833	7,486	250,395	228,607	108.5	107.7	(20,461)	(21,129)	(17,547)	(18,945)	(19,925)
	9 mos.	653,062	60,887	713,949	611,462	140,412	122,393	5,081	197,523	176,553	21,709	730,366	643,734	102.3	105.3	(31,590)	(28,647)	–	(29,629)	(28,284)
Kansas City Southern	3 mos.	65,204	4,513	69,717	55,854	14,531	10,204	620	15,779	13,810	3,573	61,025	50,481	87.5	90.3	7,964	5,033	6,241	5,480	3,646
	9 mos.	190,657	12,640	203,297	158,499	38,099	30,598	1,784	47,680	37,025	10,263	177,356	141,662	87.2	89.4	24,621	15,941	–	17,749	12,672
Long Island	3 mos.	4,351	79,073	83,424	77,413	19,392	16,002	849	21,203	17,965	1,356	94,013	82,623	112.7	106.7	(10,821)	(5,502)	(9,499)	(10,821)	(5,502)
	9 mos.	14,901	245,859	260,760	223,543	56,053	54,033	2,547	58,418	53,407	3,993	276,954	244,295	106.2	109.3	(16,954)	(21,555)	–	(16,954)	(21,555)
Louisville & Nashville	3 mos.	253,930	6,709	260,639	242,029	45,685	43,965	1,530	57,003	58,199	9,805	242,567	230,566	93.1	95.3	11,792	2,101	17,674	10,318	14,040
	9 mos.	764,751	20,604	785,354	706342	132,830	122,909	4,579	183,625	182,942	28,641	740,500	676,670	94.3	95.8	29,035	1,382	–	26,310	12,014
Missouri-Kansas-Texas	3 mos.	51,170	2,436	53,606	42,510	10,230	6,898	234	15,455	11,683	744	52,509	40,678	98.0	95.7	(298)	1,542	1,246	(298)	2,542
	9 mos.	148,640	7,969	156,609	117,607	25,346	22,335	702	46,031	33,740	2,127	149,434	117,211	95.4	99.6	2,097	(3,010)	–	2,597	2,175
Missouri Pacific	3 mos.	404,805	13,216	418,021	356,300	68,650	54,250	2,436	91,654	80,614	15,971	368,378	317,607	88.12	89.14	38,969	28,569	39,358	26,165	19,669
	9 mos.	1,195,052	37,879	1,232,931	1,036,202	179,759	165,183	7,300	278,400	236,607	45,665	1,077,351	908,507	87.38	87.67	129,994	104,857	122,670	89,814	72,967
Norfolk & Western	3 mos.	359,222	12,454	371,676	359,707	68,518	63,238	3,329	69,424	63,974	13,263	302,508	291,947	81.4	81.2	75,261	73,301	38,714	43,589	39,877
	9 mos.	1,102,378	37,971	1,140,350	1,057,370	190,823	163,791	9,909	211,204	189,838	39,932	912,450	837,462	80.0	79.2	250,981	233,200	–	150,973	141,454
Pittsburgh & Lake Erie	3 mos.	18,874	1,022	19,896	22,012	3,738	2,900	24,208	2,800	(198)	312	17,715	13,327	89.03	60.54	(924)	7,168	2,129	(993)	4,558
	9 mos.	57,612	3,769	61,381	57,235	9,824	8,424	62,765	5,338	4,596	1,273	48,209	43,118	78.54	75.33	3,572	12,090	12,095	2,468	8,287
St. Louis-San Francisco	3 mos.	121,459£	3,627	125,086	108,355	20,691	18,676	988	28,047	23,187	3,521	113,133	102,328	90.4	94.4	8,652	3,131	8,959	5,294	2,499
	9 mos.	367,843	11,433	379,277	320,613	62,253	55,074	2,740	85,117	71,274	10,562	341,750	296,995	90.1	92.6	28,456	13,340	–	20,299	10,469
St Louis Southwestern	3 mos.	76,472	1,990	78,462	62,924	13,964	10,162	362	14,677	9,275	6,186	69,805	54,725	88.96	86.97	6,437	7,571	7,400	5,180	7,165
	9 mos.	215,791	3,218	219,009	193,134	36,263	31,021	1,072	37,541	30,729	18,418	195,853	160,083	89.42	82.88	18,833	34,647	18,327	14,000	32,742
Seaboard Coast Line	3 mos.	289,764	10,927	297,691	253,669	46,234	43,253	2,232	66,595	60,636	9,063	262,425	238,039	88.2	93.8	51,469	27,919	31,995	48,116	31,042
	9 mos.	869,371	30,501	899,871	758,908	144,992	130,651	6,630	208,146	179,563	26,357	811,067	690,237	90.1	91.0	138,109	84,797	–	130,153	88,637
Soo Line	3 mos.	77,464	1,781	79,245	75,315	18,510	16,347	324	13,346	13,693	2,073	66,401	62,830	83.8	83.4	12,173	12,161	24,914	8,860	7,719
	9 mos.	225,678	4,885	230,563	203,732	46,827	39,971	966	43,751	42,300	6,088	195,654	179,103	84.9	87.9	34,785	24,829	–	24,004	15,548
Southern	3 mos.	385,716	10,357	396,073	367,151	71,598	64,491	4,470	70,939	65,796	18,305	333,758	300,937	84.26	81.96	54,635	61,436	45,295	36,231	40,713
	9 mos.	1,177,755	30,349	1,208,103	1,071,026	204,956	195,580	14,247	218,087	195,788	53,857	991,278	871,491	82.05	81.36	200,026	175,494	157,385	136,787	127,307
Southern Pacific	3 mos.	502,558	17,317	519,875	491,447	70,911	74,665	4,822	128,630	140,254	21,642	500,903	505,150	96.35	102.78	19,223	(14,292)	17,547	17,513	(12,436)
	9 mos.	1,471,177	47,286	1,518,463	1,429,708	196,581	213,335	14,491	394,642	391,602	61,601	1,497,032	1,387,751	98.58	97.06	13,502	51,653	20,939	12,143	47,572
Union Pacific	3 mos.	501,972	7,432	509,404	428,632	71,031	76,462	2,795	92,108	75,124	23,700	422,171	386,918	82.9	90.3	73,807	30,118	161,518	57,559	22,105
	9 mos.	1,444,862	23,756	1,468,618	1,268,523	228,518	213,439	8,181	280,826	232,399	69,729	1,267,627	1,094,193	86.3	86.3	163,698	144,472	–	124,072	103,255
Western Maryland	3 mos.	23,294	763	24,056	19,025	6,122	3,584	164	2,982	86	1,604	22,141	12,975	92.0	68.2	1,624	6,046	5,320	1,379	3,633
	9 mos.	65,708	2,871	68,579	56,612	15,926	9,928	487	9,327	6,055	4,043	60,219	43,762	87.8	77.3	9,292	13,076	–	6,228	8,770
Western Pacific	3 mos.	49,850	652	50,502	44,431	6,764	5,742	89	10,229	11,355	1,652	46,204	44,623	91.5	100.4	4,527	690	1,262	3,797	564
	9 mos.	134,214	1,971	136,185	–	17,870	–	263	31,795	–	5,033	134,389	–	98.7	–	3,664	–	–	2,982	–

* Includes subsidies

RAILWAY AGE
ADVERTISING SALES
William J. Cavenagh, Director

New York, N.Y. 10013
345 Hudson Street (212) 620-7200
W. Arthur Cubbage, Regional
Sales Mgr.

Chicago, Ill. 60602
29 E. Madison St. (312) 641-5815
Robert D. Bartley, Regional Rgr.
Glen A. Schlueter
Regional Sales Mgr.

Pittsburgh, Pa. 15237
3232 Babcock Boulevard
(412) 931-8552
Ronald M. Giallonardo,
Regional Sales Mgr.

Atlanta, GA 30328
210 Glencourtney Drive, N.E.
(404) 393-3096
Frank T. Baker

Dallas, Tex. 75225
P.O. Box 25045
Preston Station
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Market

CARLOADINGS

Loadings of revenue freight in the week ended Feb. 14 totaled 416,647 cars, according to the Association of American Railroads. This was a decrease of 27,082 cars, or 6.1%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Feb. 14 are estimated at 17.2 billion, a decrease of 1.6% below the corresponding week of 1980.

REVENUE FREIGHTCARLOADINGS

Commodity	Feb. 14 week	Feb. 7 week
Grain	28,873	35,422
Farm products	3,561	3,736
Metallic ores	23,292	24,765
Coal	113,925	111,080
Crushed stone, gravel & sand	10,064	10,382
Nonmetallic minerals	12,647	13,477
Grain mill products	16,363	16,077
Food and kindred products	16,344	16,958
Primary forest products	17,824	18,625
Lumber & wood products (except furniture)	8,223	8,406
Pulp, paper & allied products	19,631	20,445
Chemicals & allied products	27,992	27,095
Petroleum products	5,625	6,100
Stone, clay & glass products	12,734	13,123
Coke	6,703	6,489
Metals & products	15,846	16,331
Motor vehicles & equipment	14,833	16,218
Waste & scrap materials	12,144	12,159
Forwarder & shipping assn. traffic	9,882	10,514
All other carloads	39,878	40,328
LCL traffic	263	261
Total cars loaded	**416,647**	**427,991**
Cumulative total	1981	1980
7 weeks	**2,894,812**	**3,012,056**
Estimated revenue ton-miles (billions), 7 weeks	**120.6**	**118.9**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Feb. 7 totaled 32,487 cars (5.1% below the corresponding 1980 week) and 58, 789 trailers or containers (down 5.9% from 1980). Cumulative volume for the first 6 weeks of 1981 is 177,936 cars (down 8.6% from 1980) and 321,144 trailers or containers (down 8.5% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Jan. 31 totaled 5.8 million tons (down 12.2% from 1980). Cars loaded totaled 84,863 (down 16.8% from 1980). Cumulative loadings for 1981 were up to 18.7 million tons (down 1.4% from 1980).

- *Conrail.*—Applied to the FRA for authority to install a traffic control system on one track between Riverside, Mass., and Framingham, 11 miles, in place of the existing automatic block signal system. A companion application seeks relief from the requirement that signals be placed to the right of the track governed.

- *Family Lines.*—Has accepted delivery of 2,500 piggyback trailers from the Trailmobile Division of M.W. Kellogg Co.—the largest single order in Trailmobile's history. The trailers feature prepainted galvanized steel side panels and galvanized steel posts supplied by U.S. Steel.

- *Gulf States Utilities.*—Ordered 605 100-ton, rotary-dump Coalporters from Bethlehem Steel for delivery starting in April 1982. The cars will be used to haul coal from Wyoming to Beaumont, Tex., where Gulf States is headquartered. Bethlehem's lightweight, high-capacity, low center-of-gravity gondola features a double-U floor configuration that adds several tons of load capacity.

- *Kentucky-Ohio Transportation Co.*—Awarded a contract to Strachan & Henshaw, Inc., of Blue Island, Ill., for a Rotaside railcar dumper system that is to be installed at an eastern port. The equipment will automatically index and unload random car trains at a rate of more than 35 cars per hour with the loaded cars always under positive control.

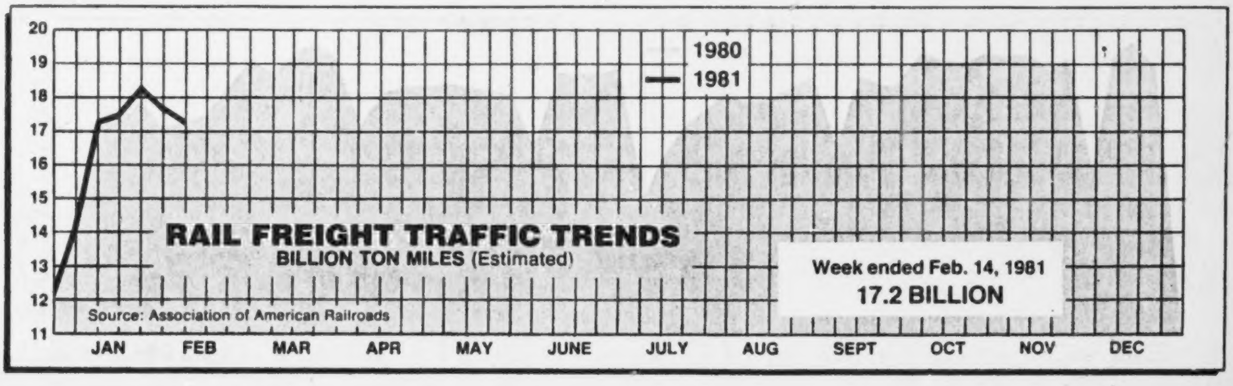
- *Norfolk & Western and Conrail.*—Applied jointly to the FRA for authority to replace a manual interlocking at a crossing at Reddick, Ill, with an automatic interlocking.

- *Washington Metropolitan Area Transit Authority.*—General Railway Signal is the apparent low bidder on a contract for signaling and otherwise equipping a $6.2 million WMATA test track. The 1.5-mile line will eventually feed into a planned line connecting Springfield, Va., with downtown Washington.

- *Locomotive ownership and condition.*—Class I roads owned or leased 28,222 diesel-electric units on Jan. 1, an increase of 285 units over Jan. 1, 1980, according to AAR yearly summary.

	Owned or Leased Jan. 1		Stored Serviceable Jan. 1		Waiting Shops Jan. 1	
	1981	1980	1981	1980	1981	1980
Diesel-electric(units)	28,222	27,937	1,637	443	1,694	1,259
Steam (locomotives)	1	1	1	1	—	—
Electric	79	103	—	—	—	—
Total	**28,302***	**28,041****	**1,638**	**444**	**1,694**	**1,259**

* Includes 85 slug units
**Includes 77 slug units



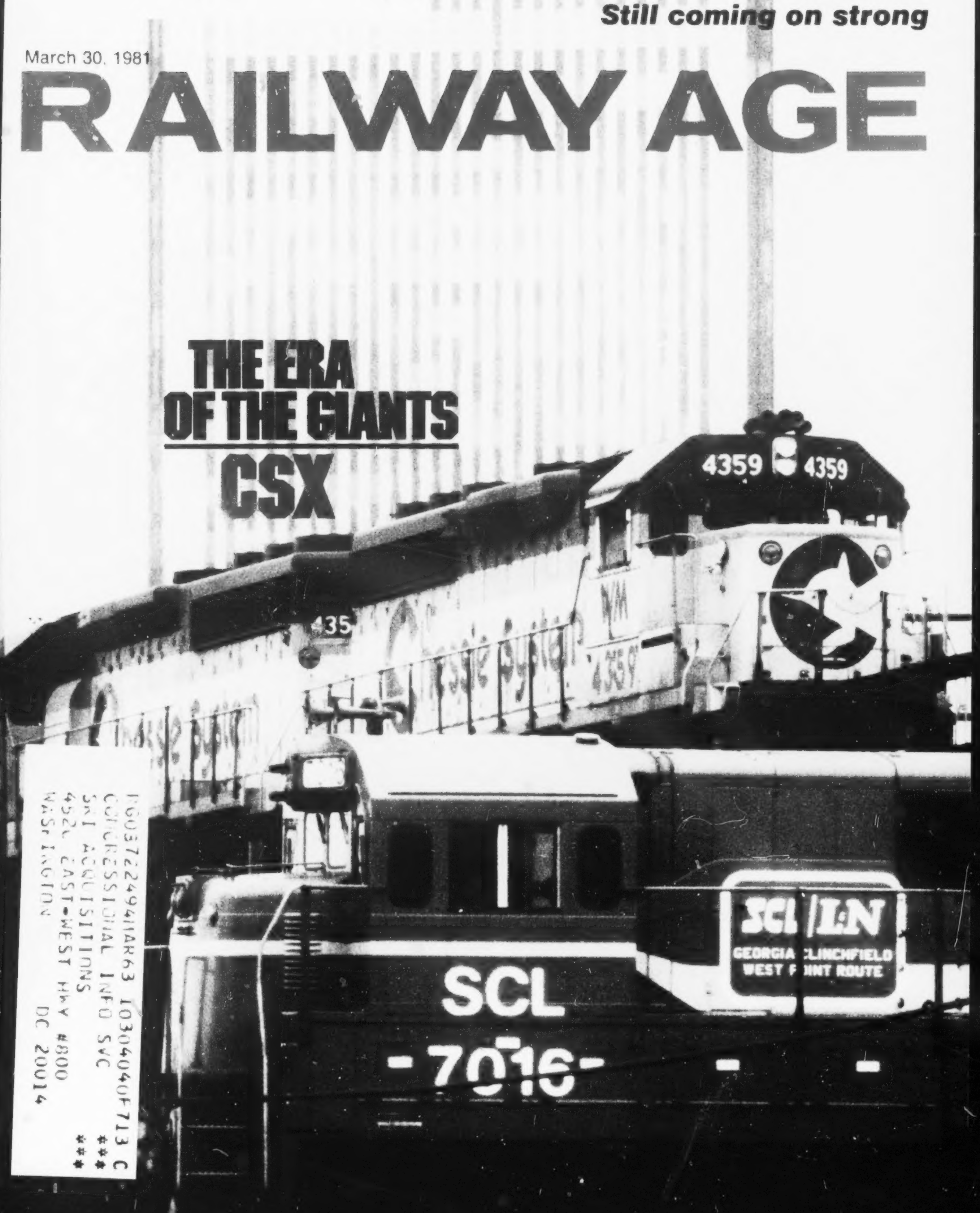
Intermodal innovation: Still coming on strong

March 30, 1981

RAILWAY AGE

THE ERA OF THE GIANTS

CSX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RAILWAY AGE

USPS 449-130

March 30, 1981 • Vol. 182, No. 6

Editorial and Executive Offices
New York, N.Y. 10014, 345 Hudson Street
212/620-7200

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Published semi-monthly by the Simmons-Boardman Publishing Corporation, 508 Birch St., Bristol, Conn. 06010. Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $10 one year, $16 two years, all other countries $25 one year. All other subsubscribers in the U.S., Canada, and Mexico: $20 one year, all other countries: $35 one year. All subscriptions payable in advance. Single copies $1 plus postage and handling, except special issues. Copyrighted © 1981.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.
Change of address should reach us three weeks in advance of next issue date. Send old address with new enclosing, if possible, your address label. Post Office will not forward copies unless you provide extra postage.

Member of

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA 18301. Controlled circulation postage paid at East Stroudsburg, PA., and at Bristol, CT.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010

Inside

LUTHER S. MILLER

THE GLASSHOPPER—AND MORE

In the minds of many Americans, the railroads are somewhat akin to the elephants of India—cumbersome, slow-moving beasts that have been all but made obsolete by 20th century technology, though they can still perform some useful heavy work. As readers of this magazine know, that image (of America's railroads, if not India's elephants) is far from accurate. Railroads have not only caught up with the march of technology; in many cases they are in the vanguard, and every now and then something happens to make even the general public sit up and take notice. One such event took place a couple of weeks ago at St. Charles, Mo.

There, at the ACF car shop, a radically different freight mover was unveiled. The Glasshopper looks much like any other ACF covered hopper, but as our reporter points out, when you tap it, it doesn't clang—it clunks. That's because the car body is made out of fiberglass-reinforced polyester—"one of the largest load-carrying structures of its kind ever to be filament-wound." The picture on p. 56, showing the Glasshopper getting all wound up, must surely be one of the most remarkable we have published in our 105 years of reporting on freight-car developments.

There's further evidence in this issue that railroads and their suppliers are not content to seek tomorrow's markets with today's technology, and this is to be found in Gus Welty's update on the intermodal innovators (p. 34). Around a dozen efforts are now under way to come up with new and ever more fuel efficient ways to entice trailers and containers off the public highways and onto the railroads. One of them—the hybrid RoadRailer—is so far off the traditional technological path that many railroaders are looking at it askance. But it has proved itself in eastern trials, and is now ready for testing under rather more difficult conditions in the West.

Technology of a somewhat different kind is also revolutionizing the executive suites. In his cover story on the CSX merger (p. 26), third in our Era of the Giants series, Associate Editor Tom Kizzia describes the role that electronic gadgetry (as opposed to gimmickry) is playing in this unusual amalgamation. It's important, writes Tom, because "this whole modern approach to merger depends on centralizing information rather than people."

WITHOUT MARKETING, NOTHING

There is always, of course, the possibility that the railroads will find themselves all dressed up, technologically speaking, with nowhere to go. That's where the marketing role comes in, and in today's fast-changing regulatory climate it's more important than ever. Associate Editor Frank Malone contributes two insightful pieces on this subject. One (p. 52) is a cautionary tale; it comes out of some conversations Frank had with a quartet of brainy people at Kearney Management Associates. What they are saying is that if present railway managers in general, and marketing people in particular, don't exploit their new opportunities, it is entirely likely that outsiders will move in and do the job. Frank's other article (p. 42) tells how one railroad, Missouri Pacific, is and has been for years seizing marketing opportunities and turning them into bottom-line gold. There's no single key to MoPac's marketing success, but Jack Looney, general sales manager-market planning and development, identifies an important one: "Our transportation people want to know if our trains are meeting the needs of our marketing effort and if not, how to change schedules so they will."

RAILWAY AGE

March 30, 1981

FEATURES

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THE ERA OF THE GIANTS
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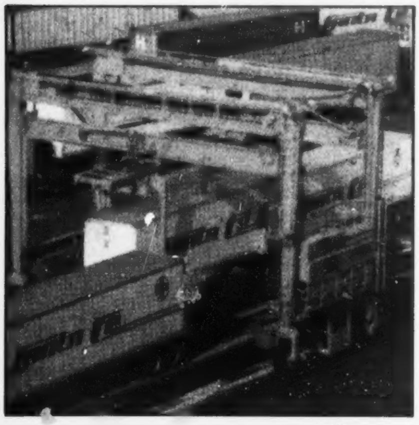
Cover article, page 26



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THE ERA OF THE GIANTS **Chessie/SCL Industries**

26 A merger of equals
CSX's Prime F. Osborn and Hays Watkins, in their first joint interview, describe how this merger is different. Savings in operating costs are a minor factor; vastly improved, "single-system" marketing capability is a major one.

34 Intermodal innovation: Still coming on strong
A dozen new concepts are now in the revenue-service, testing, or design stages. All have a chance, because standardization is no longer all-important.

42 MoPac: Good marketing—and good railroading
A customer-oriented marketing approach has increased market share and improved commodity mix, even in recessionary times, says MP's Bill Farrell.

52 Advice to marketers: Shape up or...
A group of management consultants suggests that if present rail managers can't take advantage of the changed climate, outsiders are ready to move in.

56 Glasshopper: ACF, Cargill and SP wind up a winner
It represents the most radical departure in freight-car design in many years—and there's already talk of a new plant capable of building 3,000 a year.

63 1981 Railroader's Guide to Washington
Whom to contact—and where. An up-to-date listing of the people in the new Congress and the new Administration that railroaders need to know.

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COVER: Chessie and Family Lines trains were photographed by Roy H. Blanchard at triple overpass in Richmond, VA. Southern occupies lowest level.

Amtrak: How much smaller?

The Reagan Administration's proposed budget cuts for Amtrak would eliminate all rail passenger service outside the Northeast Corridor, Amtrak president Alan Boyd has told Congress. Amtrak would be left with hundreds of unneeded cars, including new Superliners that are too big to use in the corridor, and more than $350 million in contractual commitments, according to the carrier's analysis.

Those figures were disputed by newly-confirmed Federal Railroad Administrator Robert Blanchette. While affirming the budget figure of $613 million for fy 1982 (as opposed to the $970 million proposed by Amtrak), Blanchette said the necessary cutbacks would not be so drastic. FRA estimated between $150 million and $250 million would be available for operating top-priority routes outside the Northeast. "If aggressive pricing and marketing strategies are employed, even greater amounts could be available for operating other routes," Blanchette said.

Boyd broke down the $613 million figure in detail, to show Congress how most of the money was already committed.

—Existing contracts for purchase of 150 new Amfleet II cars and 47 high-speed electric locomotives for the Northeast Corridor would cost $130 million.

—Northeast Corridor operations absorb $250 million for infrastructure costs. Amtrak also faces a debt burden of $82 million on its infrastructure, which it has asked Congress to remove. Variable costs for the corridor operation amount to $188 million, offset by revenues of $178 million, for a net operating cost of $260 million.

—Labor protection would cost $200 million the first year if all operations outside the corridor were curtailed. (FRA, predicting that more service could be retained, set this figure correspondingly lower, but offered no precise estimates.)

—It would cost $25 million to settle contractual agreements for stations and computers.

Sum total: $615 million.

In defense of that figure, Blanchette said, "Outside of a few densely populated corridors, Amtrak is a relatively non-essential component of this nation's transportation system." Nor did it represent a "fall back" mode for intercity travel in the event of an oil shutoff, he said, because filling all available seats would only increase Amtrak's passenger share from 1% to 2%. He called for Amtrak to use "business-like procedures" when setting prices and shutting down routes.

Meanwhile, FRA has divorced itself from a proposal by the Office of Management and Budget that Amtrak meet 80% of its costs through operating revenues by 1985. Blanchette said that figure would be 50% for 1982 and would remain at that level for the near future.

After a week of hearings on Capitol Hill, it appeared Amtrak was finding a little more sympathy in the House of Representatives than in the Senate.

Cairo branch due for pruning

Conrail was ready to go to the ICC late in March with an application for abandonment of 143.8 miles of its Cairo branch between Lawrenceville and Cairo, Ill. The railroad had some impressive statistics to back up its petition: (1) Costs of operating the branch now exceed revenues by around $100,000 a month; (2) at least $3.8 million would be required for track maintenance "in the very near future;" (3) $12 million in extensive track rehabilitation would be required to raise train operating speed to 30 mph.

Last year Conrail moved 13,400 carloads of coal over the line.

Said G. M. Williams, Jr., assistant vice president-regional market development: "To provide service on that line that is compensatory to Conrail would require a substantial change in the current economic outlook, through increased traffic, higher rates, and lower operating costs. We realize the importance of rail service to the shippers on the Cairo branch, but in view of the amount of money Conrail is losing in the operation of this line, we see no other alternative but to abandon or sell it. If Conrail is to meet its Congressional mandate of self-sustainability, the railroad cannot continue to operate services at a loss."

Williams said Conrail is negotiating the sale of the line with several parties. He also said that Conrail's analysis had indicated that "100% of the current coal traffic and 94% of the rest of the freight carried on the line could be handled by the six railroads which cross the Cairo branch at nine locations."

Kearney finds barge charges too low

It will take a 38-cents-per gallon tax on marine diesel fuel—not the 30 cents proposed by the Reagan Administration—to cover federal costs of operating and maintaining the nation's shallow-draft waterways, according to a study released March 6 by A. T. Kearney, Inc.

The shallow-draft waterways (as opposed to the Great Lakes and coastal ports) are now subject to a 4-cents-a-gallon tax under Public Law 95-502 enacted during the Carter Administration. The Reagan Administration has proposed a 30-cents tax to become effective by fiscal year 1983.

Kearney has been serving as prime contractor to the U.S. Army Corps of Engineers for the National Waterways Study, which is designed to assess long-term waterways requirements.

Kearney's consultants estimated that a 38-cents tax would increase the cost of shipping coal by barge on the lower Mississippi by as much as 18% as compared with no tax. The same tax imposed on the relatively high costs of shipping coal on the Monongahela river would increase shipping cost by only 13%.

"Whatever tax is imposed," said the Kearney report, "barge carriers will pass on their higher costs to their customers. Ultimately, some diversion of traffic from barge transportation may take place, but this will depend in part upon the pricing policies of railroads in transporting coal."

Shipper costs of transporting coal by barge on selected rivers under alternative taxing schemes

(Mills/Ton-Miles)

River	No Tax	$.04/ Gallon	$.10/ Gallon	$.30/ Gallon	$.38/ Gallon
Ohio	5.7	5.8	5.9	6.3	6.5
Monongahela	9.4	9.6	9.8	10.4	10.6
Tennessee	6.7	6.8	6.9	7.4	7.6
Lower Mississippi	4.0	4.1	4.2	4.6	4.7

Source: A. T. Kearney, Inc.

Market

CARLOADINGS

Loadings of revenue freight in the week ended March 7 totaled 457,920 cars, according to the Association of American Railroads. This was an increase of 16,959 cars, or 3.8%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended March 7 are estimated at 19.2 billion, an increase of 2.7% above the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity	Mar. 7 week	Feb. 28 week	Feb. 21 week
Grain	33,314	29,937	30,201
Farm products	4,403	4,675	4,265
Metallic ores	26,718	26,012	24,983
Coal	130,847	130,515	125,823
Crushed stone, gravel & sand	11,307	11,193	9,944
Nonmetallic minerals'	13,172	13,429	12,090
Grain mill products	15,279	16,383	16,257
Food and kindred products	16,410	17,447	16,497
Primary forest products	19,586	20,094	18,830
Lumber & wood products (except furniture)	8,806	9,547	8,581
Pulp, paper & allied products	20,881	21,486	20,403
Chemicals & allied products	28,380	29,615	27,712
Petroleum products	5,038	5,431	5,522
Stone, clay & glass products	14,619	14,436	13,346
Coke	6,183	6,502	6,211
Metals & products	17,337	18,908	17,481
Motor vehicles & equipment	17,702	18,050	17,108
Waste & scrap materials	13,100	13,054	13,018
Forwarder & shipping assn. traffic	11,559	11,743	10,320
All other carloads	42,816	44,657	40,598
LCL traffic	463	300	277
Total cars loaded	**457,920**	**463,414**	**439,467**
Cumulative total	1981		1980
10 weeks	**4,256,847**		**4,355,194**
Estimated revenue ton-miles (billions), 10 weeks	177.6		175.1

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Feb. 28 totaled 35,103 cars (1.2% above the corresponding 1980 week) and 63,776 trailers or containers, virtually the same as last year. Cumulative volume for the first 9 weeks of 1981 is 276,800 cars (down 6.8% from 1980) and 500,803 trailers or containers (down 6.8% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Feb. 21, totaled 5.06 million tons (up 5.0% from 1980). Cars loaded totaled 75,132 (up 2.9% from 1980). Cumulative loadings for 1981 were up to 33.9 million tons (up 1.7% from 1980).

- *CP Rail.*—Awarded a $5.7-million contract to General Railway Signal for installation of computerized control systems at Toronto Yard (formerly Agincourt) in Ontario and at Alyth Yard in Calgary, Alta. The yards will continue to use existing car retarders and switch machines, but they will be controlled by the GRS computer systems.

- *Griffin Wheel Co.*—Plans to expand wheel production capacity by 20% at its Griffin Canada Inc. plant at Winnipeg, Man. The expansion, to be completed during the summer of 1982, reflects a growing demand for wheels in western Canada, according to Griffin President Cedric P. Voll.

- *New York City Transit Authority.*—Union Switch & Signal is the apparent low bidder on a $13.9-million wayside signaling order for NYCTA's Jamaica and Canarsie lines.

- *Freight cars and locomotives.*—The following report has been received from the AAR and the ARCI.

DELIVERED

	January		December
	1981	1980	1980
Built new by carbuilders	5,064	7,365	5,151
Built new in RR shops	272	428	379
Built new—total	5,336	7,793	5,530
Rebuilt	35	107	13
TOTAL DELIVERED	**5,371**	**7,900**	**5,543**
Locomotives (new and rebuilt)	29	169	149

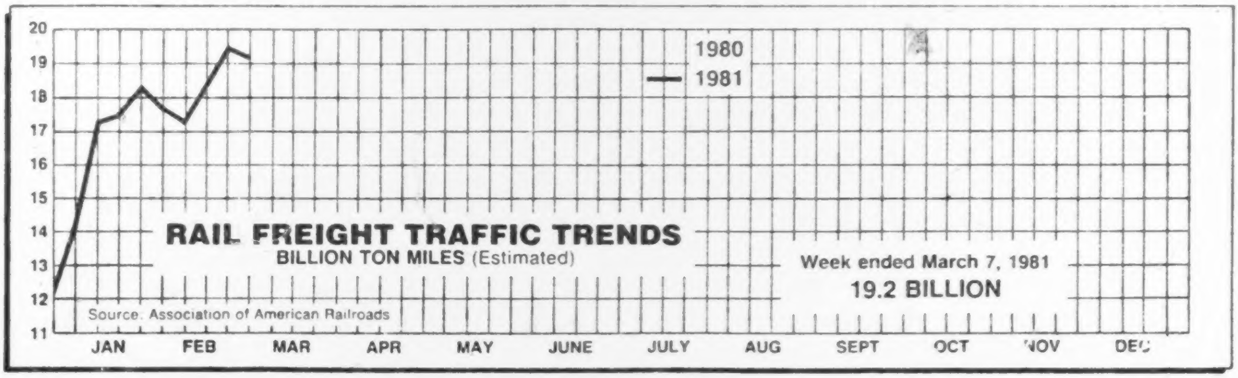
ORDERED

	January		December
	1981	1980	1980
To be built new by carbuilders	2,147	6,310	4,722
To be built new in RR shops	0	0	0
To be built new—total	2,147	6,310	4,722
To be rebuilt	300	765	0
TOTAL ORDERED	**2,447**	**7,075**	**4,722**

ON ORDER AND UNDELIVERED

	February 1		January 1
	1981	1980	1981
To be built new by carbuilders	44,219	109,776	47,136*
To be built new in RR shops	4,232	5,824	4,504
To be built new—total	48,451	115,600	51,640*
To be rebuilt	265	758	0
TOTAL ON ORDER	**48,716**	**116,358**	**51,640***
Locomotives (new and rebuilt)	524	1,287	665

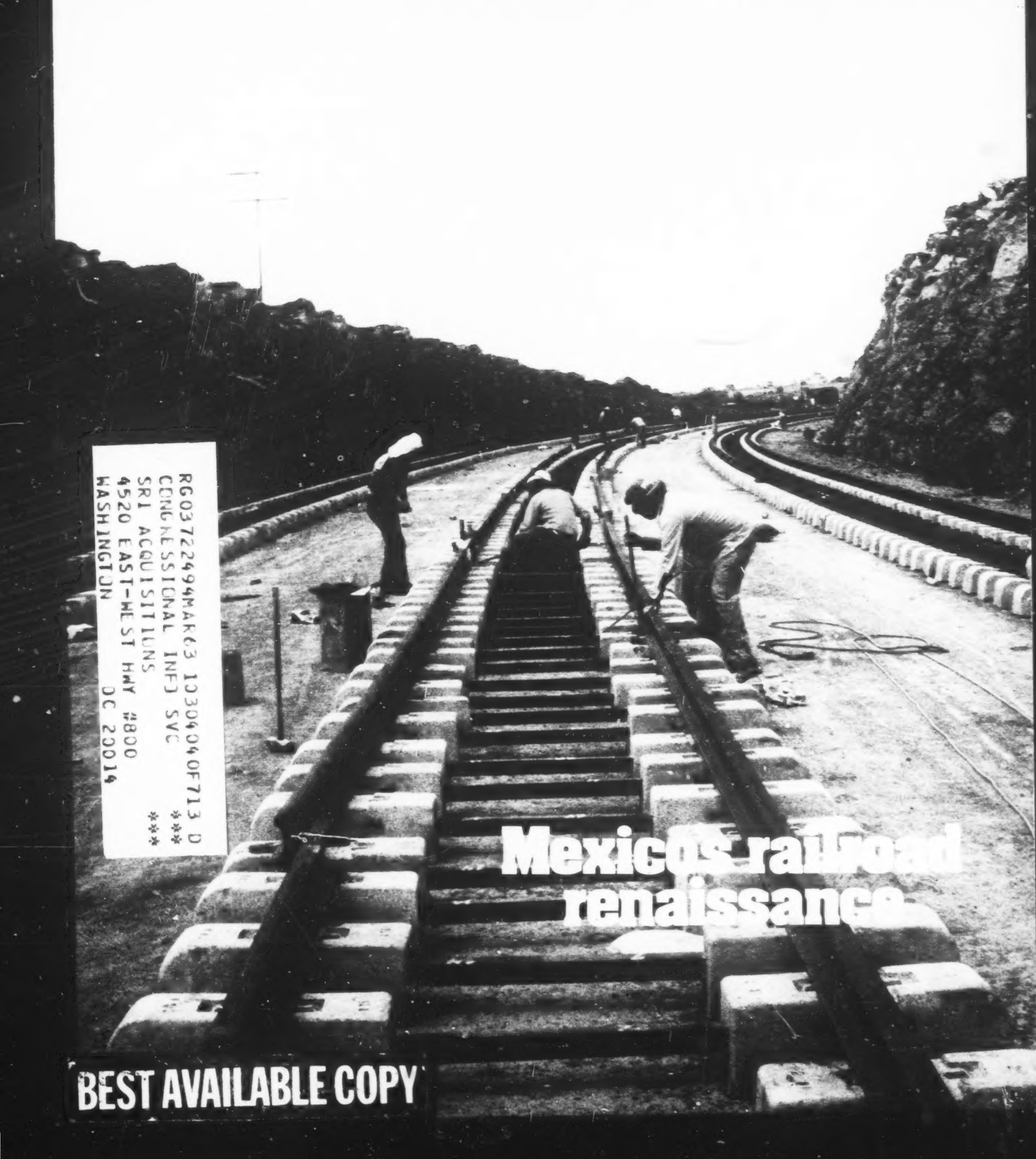
*Revised



Moving People: The search for tomorrow

April 13, 1981

RAILWAY AGE



Mexico's railroad renaissance

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RAILWAY AGE

USPS 449-130

April 13, 1981 • Vol. 182, No. 7

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Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA 18301. Controlled circulation postage paid at East Stroudsburg, PA., and at Bristol, CT.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010

Inside

LUTHER S. MILLER

THE MEXICAN CONNECTION

Mexico's railroad system, which is 100 years old and looks every day of it, is going through the pangs of rebirth. It is a costly process and sometimes a painfully slow one. You don't undo, in a year or two, the effects of decades of neglect and malnutrition. But no one doubts that the end result will be worth all of the time and the money: a rail system capable of participating fully in Mexico's industrial redevelopment. Oil is paying for the industrialization of this once-poor country, and oil is helping to pay for a sweeping rehabilitation of its railroads.

What is happening in Mexico is winning much attention—and applause—north of the border. For one thing, Mexico's railroads are increasingly important connections for U.S. carriers, which are funneling raw and manufactured materials by the thousands of carloads into a system that is ill-equipped to handle the traffic. (Up to 36,000 cars have recently been jammed up at frontier crossing points.) For another, Mexico's multi-billion-dollar rail renovation is providing welcome markets for U.S. and Canadian suppliers at a time when domestic markets are sagging.

Associate Editor Frank Malone recently spent a week in Mexico, visiting construction sites and shops and interviewing key railway officers. His report starts on p. 22.

It has been said before, but this time it can be said with considerable conviciton: For Mexico's railways, *manana* appears finally to be arriving.

PASSENGER TRAINS, OVER THERE AND OVER HERE

In recent months we have been reporting on the awakening interest at the state level in high-speed intercity passenger train service. California and Ohio in particular have said they want a level of service beyond that which Amtrak has been able to provide—and they have been looking to Europe and Japan for guidance. Europe and Japan, eager to find new markets for their advanced passenger technology, have been sending emissaries and teams of consultants to this country to work with state planners.

Japan's bullet trains, which have captured the imagination of Ohio planners, are well known. Less well known perhaps, in the U.S., is the state of the art in Europe. With that in mind, we assigned Associate Editor Tom Kizzia to spend a few weeks in Britain, France, and Germany to find out what those countries are offering to the U.S.—and how likely (or unlikely) it is that the U.S. will buy. The assignment was made several months ago; it was completed in February.

By coincidence, Tom's story on his European odyssey (p. 46) is published in the same issue that carries our story on Amtrak's 10th birthday (p. 38)—a story that suggests that this milestone may be Amtrak's last as a truly national carrier.

While it wasn't planned this way originally, the publication of these two stories cheek to jowl may at least serve to remind our readers that the whole world hasn't gone mad.

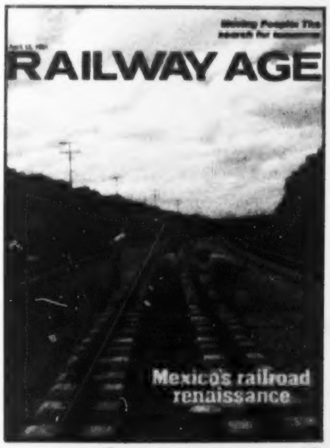
PUTTING CHESSIE BACK ON THE MAP

We called our Mar. 30 story on CSX "A merger of equals." But, alas, the map that appeared with that story showed only one half of this splendid amalgamation—SCL Industries' Family Lines. Omitted, because our printer dropped the blue color plate, was the Chessie System. We have now reprinted that article, complete with the front cover—and a complete map. Readers who would like to have a copy may get one by writing to our publisher.

RAILWAY AGE

April 13, 1981

FEATURES



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22 Rail renaissance in Mexico
A massive, multi-billion-dollar renovation of Mexico's railroads is well under way. It includes a new electrified line, numerous rebuilt lines, four yards, and thousands of cars and locomotives, many from the U.S. and Canada.

30 Mexico's amazing Metro
Already handling a staggering passenger load (2.5 million riders a day) on a 31.6-mile system, Mexico City's subway will double rideship with the opening of 20.4 more miles in 1982. Some planners see a 198-mile system by year 2000.

38 For Amtrak, a not-so-happy anniversary
Approaching its 10th birthday, Amtrak is fighting for its life as a national passenger carrier. President Alan S. Boyd says the budget cut proposed by the Reagan Administration would limit future service to the Northeast Corridor.

46 The search for tomorrow
The great train race is gathering speed in Europe, and the U.S. is a most interested bystander, especially at the state level. The main contenders: France's TGV, Britain's APT, Germany's maglev. At stake is a world-wide market.

59 Conrail: Sale — or salvation?
The DOT wants to give Conrail only enough money to keep it going pending a "fire sale." Conrail believes that given enough time it can become self-sustaining. USRA wants to give the railroad at least another two years.

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COVER: Associate Editor Frank Malone photographed this three-track section of NdeM's new electrified Mexico City-Irapuato line.

Market

CARLOADINGS

Loadings of revenue freight in the week ended Mar. 21 totaled 463,089 cars, according to the Association of American Railroads. This was a decrease of 10,725 cars, or 0.2%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Mar. 21 are estimated at 19.4 billion, a decrease of 0.1% below the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity	**Mar. 21 week**	**Mar. 14 week**
Grain	27,396	26,964
Farm products	3,376	3,773
Metallic ores	27,837	29,192
Coal	135,341	120,763
Crushed stone, gravel & sand	12,337	12,932
Nonmetallic minerals	13,501	13,496
Grain mill products	15,682	15,459
Food and kindred products	16,462	16,174
Primary forest products	19,592	19,744
Lumber & wood products (except furniture)	9,009	8,543
Pulp, paper & allied products	20,649	20,214
Chemicals & allied products	30,399	29,327
Petroleum products	5,019	5,318
Stone, clay & glass products	14,911	14,680
Coke	6,545	6,481
Metals & products	17,527	16,806
Motor vehicles & equipment	18,866	18,586
Waste & scrap materials	13,801	14,524
Forwarder & shipping assn. traffic	11,246	11,199
All other carloads	43,322	43,853
LCL traffic	271	448
Total cars loaded	**463,089**	**448,476**
Cumulative total,	1981	1980
12 weeks	**5,167,865**	**5,279,081**
Estimated revenue ton-miles (billions), 12 weeks	**215.9**	**213.9**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Mar. 14 totaled 34,401 cars (2.3% below the corresponding 1980 week) and 62,259 trailers or containers (down 2.5% from 1980). Cumulative volume for the first 11 weeks of 1981 is 345,133 cars (down 6.2% from 1980) and 624,205 trailers or containers (down 6.3% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Feb. 28 totaled 5.2 million tons (down 9.9% from 1980). Cars loaded totaled 76,199 (down 11.9% from 1980). Cumulative loadings for 1981 were 39.1 million tons (down slightly from 1980.) 1980).

- *National Railways of Mexico (NdeM).*—Spending for improvements in 1981 will total about $460 million, as follows: $325 million for new cars and locomotives; $59.3 million for installation of new or used rail and construction or lengthening of sidings; $7.7 million for bridges and related structures; $15.6 million for yards and shops; $12.1 million for new track machinery; $29.1 million for communications and signaling, especially for ctc; and $10.7 million for new shop equipment. (Not included in the NdeM budget is new track construction, which is financed by the Ministry of Transport and Communications.)

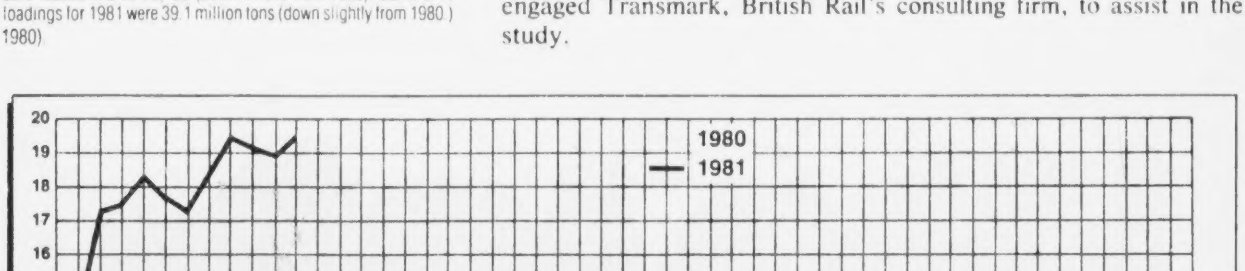
- *PLM Railcar Maintenance Co.*—Has negotiated coal-car maintenance contracts with Wisconsin Power & Light Co., Madison, Wis., and Unitrain, Inc., a subsidiary of Iowa Resources Inc., Des Moines. Under the contract with WP&L, PLM will maintain 830 cars that carry coal from the Powder River Basin in Montana and Wyoming. This contract raises the total number of cars maintained at PLM's Miles City, Mont., shop to 1,300. Under the Unitrain contract, PLM will maintain 505 coal cars at its Alliance, Neb., shop, which now has over 4,300 cars under long-term contract.

- *San Diego Metropolitan Transit Board.*—A $1-million contract has been awarded to WABCO's Union Switch & Signal Division for train control and highway grade crossing equipment for MTB's new light rail transit system (*RA*, June 9, p. 34). Union Switch will supply an absolute block signal system plus 27 grade crossing warning installations including automatic gates and flashing lights. The contract was awarded by Fishback and Moore, Inc.

- *Snowmass Coal Co.*—Awarded a contract to Dravo Corp. to design and construct a truck-to-train coal-loading facility near Carbondale, Colo. Scheduled for completion in mid-1981, the facility will unload coal from trucks and move it approximately 2,000 feet, via a 500-ton-per-hour conveyor, to a railyard. The conveyor will load railcars through a surge bin and loadout gate.

- *Tri-County Metropolitan Transportation District of Oregon (Portland).*—Will open bids May 14 for 26 light rail vehicles. The qualified bidders are Bombardier of Canada and Siemens-DuWag of Germany.

- *VIA Rail Canada.*—Retained the Toronto-based engineering and planning firm of Cole, Sherman to conduct a $500,000 study of maintenance and repair operations across Canada. Cole, Sherman has engaged Transmark, British Rail's consulting firm, to assist in the study.



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The great truck race: Temporarily on hold

April 27, 1981

RAILWAY AGE

THE ERA OF THE GIANTS

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RAILWAY AGE

April 27, 1981

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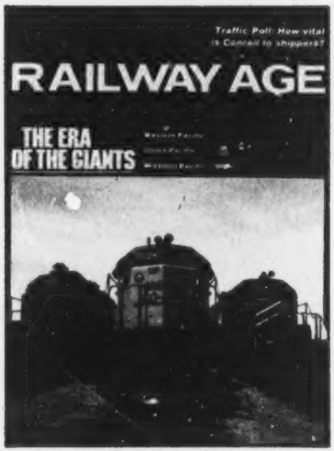
THE ERA OF THE GIANTS UP/MP/WP

20 A whole greater than the sum of its parts
Three strong railroads, sensing trouble ahead if they pursue their independent ways, want to achieve continued strength through unity. But it won't be easy. The case is so complex it could be the ICC's toughest in many years.


Traffic Poll: How vital is Conrail to shippers?

RAILWAY AGE

THE ERA OF THE GIANTS

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28 GE's C36-7: A balance of power
Norfolk & Western has ordered six of the new high-horsepower, high-adhesion units. In formally introducing the first unit April 14, GE seized the occasion to show off its modernized manufacturing facilities in Erie, Pa.

36 Alternative fuels: A progress report
Southwest Research Institute continues its search for less expensive fuels for medium-speed diesel engines. Results to date are called encouraging, but much more testing is needed, along with much more money to pay for it.

40 The great truck race: Temporarily on hold
The Truck Design Optimization Project, which tests premium trucks against each other and against standard trucks, is running into an old problem: funding. Results so far, while inconclusive, do provide some broad guidelines.

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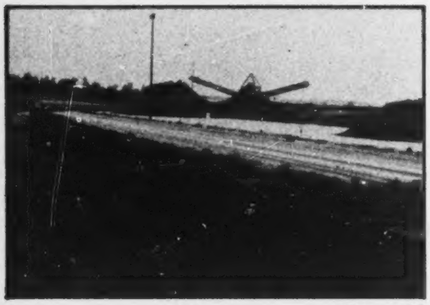
50 What Conrail wants from Congress—and others
CR's Stanley Crane calls not only on Congress, but on labor, shippers, and all others who benefit from rail service in the Northeast and Midwest, to make the "sacrifices and contributions" needed to maintain that service.

54 The Corridor study: Amtrak vs DOT
The Emerging Corridors study, originally designed to pinpoint those thickly peopled corridors best able to support high-speed passenger service, has run into trouble, because its two "authors"—Amtrak and DOT—can't agree.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COVER: Side-by-side locomotives of WP, UP, and MP symbolize the hoped-for union of the three roads.

RAILWAY AGE/News

Railroad rate of return at 25-year high

The Association of American Railroads has now closed the books on 1980—and what those books show, for the railroad industry as a whole, is an uncommonly rosy financial picture. In a year of general economic recession, the Class I railroads reported net railway operating income of $1.337 billion and a rate of return on net investment of 4.25%, highest in a quarter of a century. In the previous year, net railway operating income was $858 million and the rate of return was 2.91%.

Ordinary (net) income last year was $1.131 billion, up from $839.5 million in 1979.

An AAR statement attributed the improved earnings "in part to record traffic levels, improved utilization of equipment, and additional revenues emanating from rate adjustments during the year."

Operating revenues increased by $2.9 billion; operating expenses rose by only $2.26 billion.

AAR President William H. Dempsey noted that despite the recession, coal and grain movements remained strong. Coal was up nearly 9%; grain rose by 10%.

Dempsey called the improvement in earnings "encouraging," but said profits "remain woefully lower" than the levels required to maintain the industry in a healthy posture. He pointed out that maintenance of way expenditures rose to $4.9 billion in 1980, an increase of 7% over 1979, and maintenance of equipment outlays rose to $6.4 billion, an increase of 6.3%.

Seven of the 36 reporting Class I railroads operated at a loss in 1980—five in the East, one in the West and one in the South.

CLASS I RAILROADS IN THE UNITED STATES
For the Calendar Year

	1980 (millions)	1979 (millions)
Operating revenues	$28,254.4	$25,352.3
Operating expenses	26,352.2	24,092.9
Income taxes on ordinary income	309.8	209.5
Provision for deferred taxes	283.0	213.4
Net railway operating income		
United States	1,337.3	857.9
Eastern District	5.6	Def. 164.9
Southern District	417.3	345.0
Western District	914.4	677.8
Rate of return on net investment	4.25%	2.91%
Ordinary net income*		
United States	1,130.8	839.5
Eastern District	9.6	Def. 128.8
Southern District	392.5	316.5
Western District	728.7	651.8

For Fourth Quarter

	1980	1979
Operating revenues	$7,514.0	$6,851.3
Operating expenses	6,807.4	6,422.1
Income taxes on ordinary income	122.8	56.2
Provision for deferred taxes	52.3	79.3
Net railway operating income		
United States	539.6	299.1
Eastern District	101.9	Def. 21.4
Southern District	122.2	100.3
Western District	315.5	220.2
Ordinary net income*		
United States	545.2	317.7
Eastern District	128.0	Def. 0.9
Southern District	120.5	99.9
Western District	296.7	218.7

Def. = Deficit *Income before extraordinary items.

Amtrak: Cut down in its prime?

At a time when the Reagan Administration is insisting that much of the Amtrak system is a useless drain on the federal treasury, the railroad is experiencing "unprecedented demand for rail passenger service." "Anyone not aware of this situation," adds Amtrak in a setting-the-record straight statement, "simply hasn't tried to make a reservation recently."

Amtrak made these points in its April 15 statement:

—"In the month of March, typically a low ridership month, at least 6,100 persons had to stand on Amtrak trains due to crowded conditions. Amtrak's problem isn't having enough passengers to fill its seats; it's having enough equipment to satisfy the demand for those seats."

—"As of April 1, all coach and/or sleeping accommodations had been completely sold out on a total of 645 trains operating between April and September. With the exception of 22, all of these trains operate outside the Northeast Corridor. (Most trains in the Northeast Corridor do not require reservations.)"

—"As of April 1, almost 13,500 persons had been placed on waiting lists at Amtrak's reservations centers in the event that more space becomes available. One reservations center has received more than 2,000 waiting list requests for space on New York-Florida trains for a 10-day period alone."

—"Systemwide, over 40% of Amtrak's coach seats on reserved trains are booked two weeks in advance. Over a third of all such seats are already booked through Easter. Over two-thirds of all overnight accommodations are already booked through Easter as well. Amtrak's busy season, the summer, will see much higher advanced booking levels."

—"Even though Amtrak's five reservations centers handled a record of 22 million calls in fiscal year 1980, they cannot handle all the requests for information and reservations they receive daily. In this fiscal year alone, the call volume has increased by an average of 7.3%. In view of this increasing amount of interest in Amtrak service, the corporation is currently undergoing a massive moderniza-

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Corridor study: Amtrak vs DOT

"The findings of this study now confirm our view that densely populated corridors offer the most promising markets for developing cost-effective passenger rail service in the United States...."

—Amtrak President Alan S. Boyd commenting on the Emerging Corridors report.

"Few, if any, of the markets have any potential to support cost effective rail corridor service...."

—Secretary of Transportation Drew Lewis commenting on the same report.

How the Emerging Corridors Compare to the Northeast Corridor:

All information expressed as a percentage of NEC data

Corridor	Population	Average Speed	Avoidable Cost	Total Passenger Miles
Atlanta-Nashville	14.5	56.0	5.1	0.9
Atlanta-Savannah	11.0	61.0	5.0	0.37
Boston-Springfield-New Haven	23.0	58.0	4.6	2.9
Cleveland-Columbus-Cincinnati	24.0	62.0	5.4	1.5
Chicago-Cincinnati	41.9	64.0	6.9	5.4
Chicago-Cleveland	46.6	71.0	9.8	4.5
Chicago-Detroit	57.3	68.0	11.4	7.4
Chicago-St. Louis	41.9	66.8	9.7	4.8
Chicago-Twin Cities	50.0	73.0	9.9	6.7
Chicago-Milwaukee	37.0	73.7	4.5	2.0
Los Angeles-Las Vegas	33.3	64.0	8.1	5.3
Los Angeles-San Diego	48.7	66.4	12.1	9.2
San Jose-Reno	25.2	60.0	7.7	2.7
San Jose-Sacramento	58.1	61.0	3.7	0.8
Miami-Jacksonville	20.5	65.2	9.2	4.8
New York-Buffalo	82.1	71.8	26.0	17.2
New York-Albany	54.0	72.4	11.5	4.7
Philadelphia-Atlantic City	22.2	50.1	15.3	10.0
Philadelphia-Harrisburg	23.5	78.8	6.6	3.2
Seattle-Portland	15.0	62.5	8.0	2.9
Texas Triangle	29.5	67.3	22.8	7.1
Dallas/Ft. Worth-Houston	26.5	67.3	9.3	3.0
Dallas/Ft. Worth-San Antonio	21.0	67.0	10.1	2.6
Houston-San Antonio	17.0	67.0	4.7	1.5
Washington-Richmond	17.1	64.1	4.3	2.0

Coming as it has from a shotgun wedding of the Department of Transportation and Amtrak, the Emerging Corridors Report demonstrates little mutual respect or trust between the two agencies. Riddled with ifs, ands, and buts, the report reflects two frequently opposing points of view.

The report identifies and analyzes 25 intercity corridors and corridor segments for their potential to support a minimum of three daily passenger train round-trips at a top speed of 79 mph. These guidelines had been established in a preliminary report issued in July 1980. That study determined, to DOT's and Amtrak's satisfaction, that higher speeds could not justify the costs to attain them. [Increasing the number of daily round-trips reached the point of diminishing returns somewhere between three and six trips for most corridors.]

The most recent study was due to be submitted to Congress on Feb. 15, but delayed until April 10 while the new administration made its mark. In the report, the corridors are ranked by the cost of achieving projected fuel savings and the cost per passenger mile. While the new study generally concurs with many of the earlier report's findings, it differs significantly in the method of establishing a comparitive ranking between corridors. DOT had included past state support as a factor in determining the likelihood of future involvement, a practice the Department now says served to "penalize or reward states for past performance when the basic issue being addressed is what state and local authorities would do about future rail passenger service."

DOT and Amtrak may find themselves finally agreeing on that point, but the report is filled with brickbats thrown by Amtrak at many other major assumptions made by DOT.

Most significant among the disputes is the method used to determine each corridor's cost-effectiveness. The report notes, "Since all energy conservation assumptions and the cost-effectiveness analysis are based on what Amtrak considers to be a fundamentally erroneous projection, Amtrak suggests that such conclusions must be treated with caution."

Amtrak complains that the report paints a picture of massive shifts between buses and trains when frequency and ticket prices change. According to the report, a bus is more fuel efficient (at an average 135 passenger-miles/gallon) than most trains. The shift of travelers from bus to rail would result in the consumption of more fuel over many of the studied routes. Amtrak maintains that most of its passengers have historically come from auto users and that this trend would continue, resulting in better fuel economy ratings.

As to DOT's method of computing rail efficiency, Amtrak wonders whether the tests used as a model can accurately be applied to other corridors. The data is from sample trips between Boston and New Haven, a route on which, Amtrak notes, there are unique curve and grade characteristics.

Amtrak stands up again in its own defense when DOT starts making the cost-effectiveness evaluation. The Department uses three basic criteria for each route: 1) capital improvement cost per passenger mile, 2) the cost of achieving expected fuel savings (between $5 and $316 per gallon of gas saved, depending on the corridor), and 3) avoidable loss per passenger mile.

"This approach," Amtrak says, "does not take into account a number of factors that are significant...such as environmental benefits, improved traveler safety, urban development benefits, and productive employment opportunities. Nor does this approach take into account the cost effectiveness of rail service as compared with other transportation modes serving the same points."

The reason for all this fuss, of course, is that Amtrak fears DOT's projections will spell doom for many if not all the emerging corridors. Amtrak considers the development of short-distance rail service essential to its survival.

Amtrak President Alan S. Boyd says, "These lucrative markets are a natural for Amtrak because our current corridor experience has proven that the public will use alternatives to the private automobile if those transportation alternatives are competitively priced, comfortable and convenient."

Among the 25 corridors studied, Amtrak points out that at least nine meet the congressionally mandated performance criteria for short-distance trains. These routes would cover more than 50% of their avoidable loss and are listed in order of their performance:

—Los Angeles-San Diego.
—Chicago-Cincinnati.
—Boston-Springfield-New Haven.
—Los Angeles-Las Vegas.
—Chicago-Twin Cities.
—Chicago-Detroit.
—New York-Buffalo.
—Philadelphia-Atlantic City.
—Miami-Jacksonville.

Four other routes join those nine if Amtrak's ridership projections are used:

—Philadelphia-Harrisburg.
—Washington-Richmond.
—Chicago-St. Louis.
—Chicago-Cleveland.

The report uses two basic situations to judge corridor performance. One supposes starting service from scratch, whether trains already operate over the route or not. The other, "incremental" basis computes the cost of providing additional frequency of service.

Under the incremental method it is interesting to note how present services would fare when frequency is increased. The Los Angeles-San Diego corridor, which has experienced explosive ridership growth over the past five years, would continue to grow with the increased frequency, but not at the rate of past growth. In fact, passenger miles per train mile would actually decrease as frequency and ridership increase. By contrast, the New York-Buffalo corridor shows an overall gain as the result of increased frequency.

The question, though, is not so much over what kind of service and when, but whether this study will have any impact at all.

Will the report, as Amtrak hopes, lead to a network of passenger trains? Or will the study instead be put in the corner, seen once but never heard from again?

One thing is certain. The Emerging Corridor Report will not get much attention until some of the other major budget battles are over.

Amtrak is engaged in a fight for its life with the Department of Transportation, which is also trying to slice up Conrail, reduce the Northeast Corridor Improvement Project, and grapple with a host of other thorny railroad issues. The relevant congressional committees are booked solid for hearings on these subjects and have precious little time now to look at Emerging Corridors.

Even the National Association of Railroad Passengers is leaving the subject untouched for now. NARP executive director Ross Capon says, "The current administration does not seem interested in funding rail passenger service, and we're more concerned with saving what we've got."

The dust should begin to settle after May 15 when budget bills have to be reported out of House and Senate committees. What happens then? One congressional aide says, "Corridor service is the most profitable and makes the most sense. I do expect rail corridors to be addressed in the Amtrak legislation and it is very likely that some money will be appropriated for them."

But another aide notes bluntly, "If the Amtrak system is shrinking it would hardly make sense to expand into more corridors."

The next logical step for the emerging corridors would be an appropriation of money for engineering studies on the most promising routes. To date, data has been gathered from trips in Amtrak's business car over the proposed corridors. Amtrak, DOT, and railroad officers have discussed some basic needs, but much more refined information would be necessary to continue studies on selected corridors.

Reagan administration resistance to passenger service, and the budget cutting scythe being wielded around Washington, might make it difficult for the emerging corridor issue to move beyond its first toddling steps. But backers of the idea might be wise to remember that you have to crawl before you can walk, and maintaining a low profile is the best way to stay clear of the blade. ■

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Market

CARLOADINGS

Loadings of revenue freight in the week ended Apr. 4 totaled 396,732 cars, according to the Association of American Railroads. This was a decrease of 21,914 cars, or 5.2%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Apr. 4 are estimated at 16.8 billion an increase of 3.0% above the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity	**Apr. 4 week**	**Mar. 28 week**
Grain	24,369	22,953
Farm products	3,003	3,083
Metallic ores	28,621	27,525
Coal	70,320	128,063
Crushed stone, gravel & sand	12,987	12,567
Nonmetallic minerals	13,794	13,293
Grain mill products	14,884	15,260
Food and kindred products	15,934	16,846
Primary forest products	18,546	19,190
Lumber & wood products (except furniture)	9,374	9,888
Pulp, paper & allied products	20,869	20,687
Chemicals & allied products	29,890	31,237
Petroleum products	4,931	5,359
Stone, clay & glass products	14,955	15,338
Coke	6,321	6,262
Metals & products	18,780	18,184
Motor vehicles & equipment	19,224	19,745
Waste & scrap materials	13,279	13,213
Forwarder & shipping assn. traffic	11,508	11,553
All other carloads	44,883	43,248
LCL traffic	260	287
Total cars loaded	**396,732**	**453,781**
Cumulative total	1981	1980
14 weeks	**6,018,152**	**6,158,525**
Estimated revenue ton-miles (billions), 14 weeks	**251.7**	**249.3**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Mar. 28 totaled 33,699 cars (5.1% below the corresponding 1980 week) and 61,296 trailers or containers (down 5.6% from 1980). Cumulative volume for the first 13 weeks of 1981 is 413,043 (down 5.8% from 1980) and 748,038 trailers or containers (down 5.9% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Mar. 14 totaled 4.8 million tons (down 4.1% from 1980). Cars loaded totaled 72,509 (down 2,412 from 1980). Cumulative loadings for 1981 were up to 49.0 million tons (up 0.1% from 1980).

- *Maryland Mass Transit Administration.*—Awarded an $8.7-million contract to Alta/CGA of Stamford, Conn., for supply and installation of an automatic fare collection system for the Baltimore Region Rapid Transit System. The contract covers equipment for the eight-mile Section A line, now under construction, with an option for equipping the six-mile Section B extension, now in final design. Alta/CGA is a joint venture of U.S. and French firms.

- *Union Pacific.*—Awarded $25.5 million of equipment trust certificates to Merrill Lynch White Weld Capital Markets Group, at an annual net interest cost for the railroad of 13.33%. Proceeds will represent about 80% of the cost of 32 3,000-hp diesel-electric units and 160 100-ton open-top hopper cars.

- *U.S. DOT Transportation Systems Center.*—Awarded a three-year, $622,064 contract to Wyle Laboratories' Scientific Services & Systems Group for engineering support in railway and transit track systems design.

- *Freight cars and locomotives.*—The following report has been received from the AAR and the ARCI:

DELIVERED

	February		**January**	**Two months**	
	1981	**1980**	**1981**	**1981**	**1980**
Built new by carbuilders	4,401	7,440	5,064	9,465	14,805
Built new in RR shops	308	463	272	580	891
Built new—total	4,709	7,903	5,336	10,045	15,696
Rebuilt	150	97	35	185	204
TOTAL DELIVERED	**4,859**	**8,000**	**5,371**	**10,230**	**15,900**
Locomotives (new and rebuilt)	67	124	29	96	293

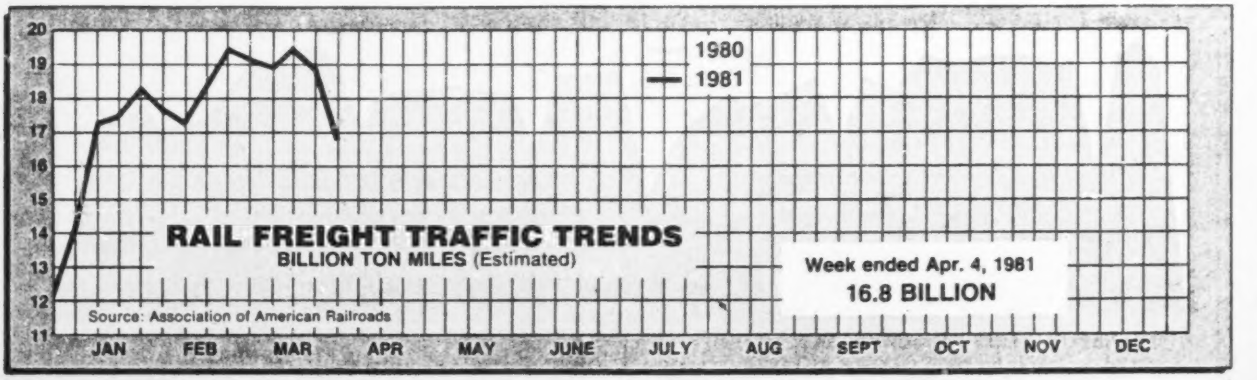
ORDERED

To be built new by carbuilders	2,069	3,776	2,147	4,216	10,086
To be built new in RR shops	0	0	0	0	0
To be built new—total	2,069	3,776	2,147	4,216	10,086
To be rebuilt	0	0	300	300	765
TOTAL ORDERED	**2,069**	**3,776**	**2,447**	**4,516**	**10,851**

ON ORDER AND UNDELIVERED

	March 1		**February 1**	**Average backlog**	
	1981	**1980**	**1981**	**1981**	**1980**
To be built new by carbuilders	41,197	104,045	44,219	42,708	106,911
To be built new in RR shops	3,924	5,361	4,232	4,078	5,592
To be built new—total	45,121	109,406	48,451	46,786	112,503
To be rebuilt	115	661	265	190	710
TOTAL ON ORDER	**45,236***	**110,067**	**48,716**	**46,976**	**113,213**
Locomotives (new and rebuilt)	471	1,291	524	498	1,289

*Due to revisions and cancellations the backlog has been reduced by 690 cars.



RAIL FREIGHT TRAFFIC TRENDS
BILLION TON MILES (Estimated)

Source: Association of American Railroads

Week ended Apr. 4, 1981
16.8 BILLION

Atlanta's MARTA: Running well, still building

May 11, 1981

RAILWAY AGE

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May 11, 1981 • Vol. 182, No. 9

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Railway Age, descended from the American Railroad Journal (1832) and the Western Railroad Gazette (1856) and published under its present name since 1876, is indexed by the Business Periodicals Index and the Engineering Index Service. Name registered in U.S. Patent Office and Trade Mark Office in Canada.

Published semi-monthly by the Simmons-Boardman Publishing Corporation, 508 Birch St., Bristol, Conn. 06010.
Subscription rates to all railroad, rail rapid transit employees and industrial traffic department employees in the U.S. possessions, Canada and Mexico: $10 one year, $16 two years, all other countries $25 one year. All other subsubscribers in the U.S., Canada, and Mexico: $20 one year, all other countries: $35 one year. All subscriptions payable in advance. Single copies $1 plus postage and handling, except special issues. Copyrighted © 1981.

Address all subscriptions, change of address and correspondence concerning them to Subscription Dept., Railway Age, P.O. Box 530, Bristol, Conn. 06010.
Change of address should reach us three weeks in advance of next issue date. Send old address with new enclosing, if possible, your address label. Post Office will not forward copies unless you provide extra postage.

Member of

Printed at Hughes Printing Co., 34 North Crystal St., East Stroudsburg, PA 18301. Controlled circulation postage paid at East Stroudsburg, PA., and at Bristol, CT.
POSTMASTER—SEND FORM 3579 TO P.O. BOX 530, BRISTOL, CONN. 06010

Inside

LUTHER S. MILLER

A SIGNAL ACCOMPLISHMENT

The history of railroad signaling goes back to the very beginning of railroading, when the oats-vs-coal equation had still not been worked out to the advantage of steam, and horsepower was still just that—horse power. In *This Fascinating Railroad Business*, Robert S. Henry described the first brave attempt at signaling on the horse railroads: "The original idea was that any carter or carrier could run his own vehicles upon the rails upon the payment of toll.It was early found, however, that controlling the movement of vehicles on the road of raised rails had possibilities of conflict and collision which were not present on the ordinary turnpike, whereupon an attempt was made to regulate conflicting claims to the right of way by setting up center posts, halfway between the turnouts provided for meeting, and prescribing that the driver who first passed the center post should have right of way to the turnout." It didn't work. Drivers raced to the center posts to avoid having to back up, and "closely disputed points as to the right of way were sometimes settled by the primitive and direct method of a fist fight."

Signaling, as it's known today, began on the Newcastle & Frenchtown in 1832. Again in the words of Bob Henry: "The signal that the way was clear was a basket covered with white cloth raised to the top of the pole. When the lookout man could see through his spyglass that this round, bell-shaped object was at the top of the pole at the next station ahead, the word passed to the conductor and engineman of the waiting train to go ahead came to be 'high ball.'"

"Highball" remains entrenched in the vocabulary of railroading. But othwerwise the language of signaling has changed as drastically as the science of railroading itself. How drastic the change has been may be seen in some of the illustrations accompanying Associate Editor John Armstrong's look back/look ahead cover story, in this issue (p. 16)—a story timed to coincide with the 100th birthday of one of the oldest railroad supply companies still doing business under its original name, Union Switch & Signal.

POSITIVE WORD FROM ALASKA ON PTC

A few years ago CN Rail created something of a stir in mechanical circles with its development of a device called Positive Traction Control. Installed on 400 of CN's GP-40's, PTC produced adhesion improvements in the range of 15-20%. The railroad engaged Vapor Canada, Inc., to manufacture the device; subsequently, the Vapor Corp. of Chicago acquired worldwide licensing rights to PTC. What has happened since then? Has PTC lived up to the billing the Canadians gave it? The answer, at least as far as the Alaska Railroad is concerned, is "Yes." One of the first two U.S. railroads to acquire PTC units, the Alaska conducted its tests a few weeks ago; as a result ARR plans to equip its entire road fleet with PTC, in the expectation of annual fuel savings of up to 15% in addition to improved locomotive utilization. Results of the ARR tests are summarized in a letter to the editor (p. 48) from ARR General Manager F. H. Jones.

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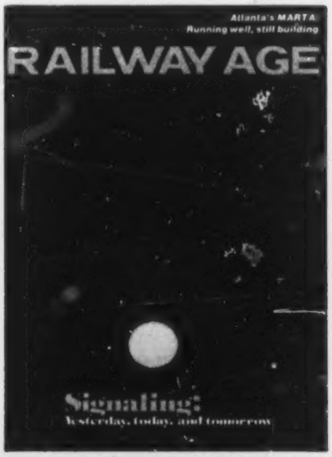
ALASKA

RAILWAY AGE

May 11, 1981

FEATURES


Atlanta's MARTA: Running well, still building
RAILWAY AGE
Signaling:
Yesterday, today, and tomorrow

Cover article, page 16

16 **Signaling: Yesterday, today, and tomorrow**
The 100th anniversary of Union Switch & Signal is the occasion for this examination of the science of signaling and control—past, present, and the probable future as railroads enter the microprocessor era.

24 **MARTA: Running well, still building**
The first 11.8 miles of a projected 53-mile system is winning more riders than projected, and on-time performance was recently averaging around 99%. Two more segments totaling 4.5 miles will open this year and next.

32 **Heavy rail transit for Honolulu?**
Planners in the 50st state's capital city have concluded that buses alone can't do the job. Present thinking centers around an 8.4 mile rail line running between the airport and the university, and fed by buses.

39 **Motive power: The coal-fired alternative**
Backers of the ACE 3000 have produced studies that show their coal-burner stacking up favorably against straight electrics. Meanwhile, they're still trying to raise the $25 million needed to support the venture.

42 **Coal: A time of challenge and opportunity**
High-ranking executives representing a broad spectrum of coal interests paint a generally optimistic picture for both domestic and export coal, though many problems—including rate controversies—remain.

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COVER: Conrail's Morrisville, Pa., yard; Roy H. Blanchard photo.

Power: The coal-fired alternative

Table I: Alternative motive power - cost factors

	Diesel	Electric		Coal-fired
Capital				
Roadway & facilities (per route-mile)		Single tk.	Double tk.	
Catenary	–	$175,000	$318,000	–
Substations, etc.	–	87,000	158,000	–
Comm. & signal mods.	–	142,000	210,000	–
Civil reconstruction (clearances)	–	54,000	79,000	–
Utility connections	–	15,000	15,000	–
Coal handling/water treatment facilities	–	–	–	$10,000
Total	Baseline – 0	$473,000	$775,000	$10,000
Locomotive units		$791,000 (3000 hp)	$1,540,000 (5100 hp)	$1,250,000 (Ace 3000)
Operating				
Energy	$.93/GAL	$.0423 KWH		$48/Ton (FOB locomotive)
Maintenance				
Locomotive	$1.33/Mile	$.65/Mile		$1.33/Mile
Catenary	–	$4400/Route-Mi./Yr.		–

With electrification stubbornly showing returns on investment in the ho-hum range despite présent and prospective massive oil/coal btu price differentials, a record turnout of members of the Southern and Southwestern Railway Association listened in Huntington, W. Va., to papers suggesting that converting coal to drawbar horsepower on the locomotive could raise ROI's to "let's go" levels without subjecting operating and maintenance officers to nightmares of unreliability and soaring shop costs.

The technology under discussion April 23 was the ACE 3000, a direct-drive, condensing steam locomotive designed by American Coal Enterprises, Inc. (*RA*, Oct. 13, 1980, p. 36). Along with the motive power units themselves, the ACE system envisions a logistic scheme for getting fuel and water aboard and ashes off the MU-capable, low-axle-load locomotives in a manner compatible with all operational requirements and within reasonable facility-cost bounds.

• Ready-made scenarios. In presenting more detailed financial projections for steamization, ACE Consultant John T. Harding (former Systems Manager for FRA's Office of High Speed Ground Transportation) was able to use FRA's published studies of U.S. railroad electrification costs and benefits and the underlying project memoranda produced by Transportation Systems Center analysts describing their detailed methodology, assumptions and scenarios. A particularly appropriate point of departure is the 26,000-route-mile network of electrification which formed the centerpiece of last October's Kansas City discussions between FRA and railroad officers (*RA*, Nov. 24, 1980, p. 26). Cost factor assumptions are summarized in Table I; the only change to the FRA report's diesel and electrification figures is an updating of fuel costs to December 1980 levels.

The assumed locomotive substitution rate in the FRA study is one 5,100-hp (3800 kW) electric for two 3,000-hp diesels, reflecting short-term acceleration capabilities with power from the wire; in the basic ACE comparison this ratio is also assumed since the coal-fired locomotive is designed to have low-speed characteristics equivalent to the 3000 hp diesel. ACE 3000 thermal efficiency at the drawbar is calculated at 18%, corresponding to the maximum of 32% for diesel-electric units of the best current design quoted in the Department of Energy-sponsored study of future propulsion systems for railroad locomotives, Phase B of which was reported by contractor Jet Propulsion Lab last December. For its study, ACE has assumed average coal-fired locomotive efficiency as half that of the diesel-electric in service, or 15%. Fuel cost is based on premium-price low-sulphur coal, with transportation and handling costs and the expenses of make-up water supply and treatment included; the ACE 3000's "service module" carries fuel for 500 miles ("15 hours at notch 8") or more, water for 1,000 miles. A principal factor in its efficiency and freedom from smoke is low-firing-rate combustion in a gasification mode which is reported to have achieved 12% drawbar thermal efficiency under normal operating conditions when applied to locomotives in Argentina and South Africa. Efficient auxiliaries supporting the compound, condensing cycle (including the microprocessor control of combustion, adhesion, expansion, and other power-generation aspects of operation which make it a one-man locomotive) provide bases for the remainder of the calculated improvement over previous steam standards while retaining direct (but fully balanced) reciprocating drive and modest (300 psi) working pressure compatible with fire-tube boiler design.

• What a few billion might do. Table II summarizes the figures from the FRA electrification and ACE coal-fired alternate motive power calculations for the middle-size (26,000 route-mile) national-network scenario in which the 14% of present route-miles carrying more than 50% of all ton-miles (generally, lines with density in excess of 30 million gross tons per year) are assumed to be shifted from diesel to alternate motive power.

The coal-fired estimates of the incremental investment require only locomotive-cost and coal/water service facility figures. The relatively long range and simplified coal- and ash-handling systems for the ACE 3000 keep the latter figure to about 3% of locomotive costs, which of course must remain relatively uncertain at this point when no prototype has been built. At least the quantities involved in this scenario support full economies of scale so far as production is concerned. At the one-for-two substitution ratio, the electric locomotives represent a very modest incremental investment in comparison to the $3.5 billion net for the coal-burners, but that in turn fades almost into insignificance when bounced against electrification costs which by now must be considered as well established as estimation can ever hope to do.

Annual net costs do favor the electric—maintaining half as many locomotives and ones without prime movers aboard saves almost $1 billion—but it is interesting to note that electrification transmission losses make overall energy costs using the same fuel lower for the self-contained motive power, even at the modest thermal efficiency assumed for the ACE locomotive.

• Better than a money-market fund? On the return-on-incremental-investment basis, though, the coal-fired alternative more than doubles that of electrification, whether or not it is assumed that diesel fuel cost will increase at more than the general rate of inflation. This is just a sample—the FRA study calculates rates of return for six scenarios: 10,000, 26,000 and 40,000-mile national networks and three site-specific maximum-density territories carrying unit coal trains, fast freight, and mixed traffic, respectively. Using exactly corresponding methodology and assumptions regarding traffic and cost escalation in each case, ROI's for the solid-fuel machines came out from 93% to 134% higher for the network cases and from 47% to 73% higher* for site-specific

---

*Assuming ACE 3000's replace diesels on a 1:1 ratio. Since its higher drawbar horsepower (up to 4000) at medium speeds might allow fewer of the reciprocating locomotives to do the job in some of the site-specific services, calculations were also made for 3:4 or 4:5 ratios as appropriate, in which case the coal-fired ROI's are much higher.

Table II: Alternative motive power Investment/Costs-credits/ROI/Net present value

26,000 Route-Mile Network
(15,600 Mi. Single/10,400 Mi. Double Track)
1980 Prices

	Electrification vs diesel	Coal-fired vs diesel
Traffic (million gtm/yr)	945,800	945,800
Locomotive fleet (units)	3400 (5100 hp)	6800 (3000 hp)
Investment ($ million)		
Catenary	6,040	–
Substations	3,000	–
Utility connections	390	–
Comm. & signal mods.	4,400	–
Civil reconstruction	1,660	–
Coal handling/water treatment facilities	–	260
Locomotives:		
New	5,240	8,500
Diesel transferred	(5,060)	(5,060)
Net investment	**15,670**	**3,700**
Annual cost-credits ($ million)		
Diesel loco replacement	(281)	(281)
Diesel fuel	(1,641)	(1,641)
Electric energy	1,110	–
Coal	–	970
Diesel loco maintenance	(1,360)	(1,360)
Elect./coal loco maintenance	409	1,360
Catenary maintenance	114	–
Net annual savings	**1,649**	**952**
Return on investment		
W/o fuel-cost escalation differential	12%	28%
With 3%/yr. diesel fuel esc. differential	15%	34%
Net present value* of investment ($ million)	**−155**	**+5,274**
Net present value ÷ net investment	**−.01**	**1.43**

*10% discount rate, 30 year horizon

electrification where the high traffic density gives the capital-intensive catenary its best shot at profitability.

Pointing out that under budgetary constraints projects are ranked according to the ratio of "net present value" of calculated savings (after applying an appropriate discount rate to future benefits) to the investment required, Dr. Harding's analysis includes net-present-value-of-investment figures for the various scenarios. As shown in Table II, for the 26,000 mile network NPV is negative for the electrification, in contrast to a value well above the investment for the coal-fired alternative. In its most favorable scenarios, electrification shows some positive NPV (though never above about one quarter of the investment); for the coal burners, ratios are generally well above unity.

Study conclusion: "Coal compares very favorably relative to electrification. Furthermore, the NPV's for coal are very robust, remaining positive with considerable increases in investment cost. New forms of coal-fired steam locomotives should be considered seriously as an alternative motive power on the nation's railroads."

● In the shop or on the road? In the second presentation to the railroaders, American Coal Enterprises EVP William L. Withuhn came down to the problem of designing and building a locomotive with such characteristics—in particular, maintenance cost equivalent to today's best diesels.

"Locomotive development in this country is littered with examples of engines which were fine performers thermodynamically but which spent too much time on the servicing pad or in the shops," said Withuhn. "All types of engines—steam, steam turbine, gas turbine, straight electric, diesel-hydraulic, diesel-electric—are affected by the same principle: success in fleet service cannot come without low maintenance costs and low maintenance downtime...good maintenance must be designed into a locomotive; reliability, maintainability and high unit-availability cannot be added as 'afterthoughts' in the design process."

Citing the overriding characteristic of the ACE 3000 as simplicity, Withuhn traced the design-study process which led the ACE team away from its original tacit assumption that the new-era locomotive would be a turbine-electric. The turbine—gas or steam—has never worked well under the variable-load characteristics of railroad service; water tube boilers to generate the high pressures essential for turbine efficiency have never been successful in ordinary service on U.S. railroads. High-amperage electrical equipment, despite the solid-state revolution in rectification and control, remains a high-maintenance item, with one-third of total locomotive maintenance costs for a typical large railroad going into alternators, traction motors, resistor grids and the like.

Most of the presentation was devoted to specific examples among the myriad of design decisions based on reliability, availability and maintainability considerations and fitted into the go anywhere-do anything concept taken from forty years of diesel-electric success:

—All roller bearings on axles, drive rods and valve gear designed to the modern and proven fully-sealed "No Field Lubrication" philosophy.

—Self-lubricating synthetic materials on parts such as journal-box liners and crossheads, eliminating open lubrication.

—Control of water chemistry within the closed cycle, eliminating water-side scale for operation for a full year between washouts.

—A clean combustion process, reducing flyash carryover to the point of eliminating cinder-cutting of tubes and superheaters.

—All servicing—sand, water, lubricants, fuel—done from ground level.

● But what about the day AFTER tomorrow? Implicit in any consideration of development of a substantially different form of motive power is the matter of its longevity, recognizing that only prototypes running successfully on the main line will give full credibility to the newcomer, and at best that's not a matter of a few bucks or a few weeks. The third phase of the DOE/JPL study mentioned above has looked into the next two decades, considering possibilities (ranging from Stirling-cycle engines to Rankine-bottoming diesel addenda) of all degrees of elegance and iffyness. The final report, which will enter the pre-release public review process next month, is anticipated with considerable confidence by the bituminous partisans—if that is any indication of the situation.

Meanwhile, what about American Coal Enterprises' progress in obtaining the private-sector funding required to put a prototype or two on the rails? A spokesman says: "We have many irons in the fire, and a firm commitment from a securities underwriter which greatly reduces the up-front funding [$25 million or so] necessary to put the show on the road; nothing more can be said at this point." ■

—John Armstrong

Market

CARLOADINGS

Loadings of revenue freight in the week ended Apr. 25 totaled 384,783 cars, according to the Association of American Railroads. This was a decrease of 69,890 cars, or 15.4%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Apr. 25 are estimated at 16.2 billion, a decrease of 8.6% below the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity	**Apr. 25 week**	**Apr. 18 week**	**Apr. 11 week**
Grain	23,359	21,824	24,399
Farm products	3,581	3,714	3,720
Metallic ores	32,815	30,377	27,813
Coal	60,973	60,552	58,920
Crushed stone, gravel & sand	15,082	13,972	14,434
Nonmetallic minerals	14,972	13,855	13,870
Grain mill products	13,589	13,709	14,470
Food and kindred products	16,019	14,968	15,680
Primary forest products	20,005	18,924	19,407
Lumber & wood products (except furniture)	9,405	9,205	9,040
Pulp, paper & allied products	20,205	19,394	19,650
Chemicals & allied products	28,537	27,478	27,768
Petroleum products	4,802	4,496	5,250
Stone, clay & glass products	14,885	14,071	15,117
Coke	6,208	5,655	6,308
Metals & products	18,176	16,372	17,244
Motor vehicles & equipment	18,986	17,084	18,872
Waste & scrap materials	13,128	12,555	13,959
Forwarder & shipping assn. traffic	10,080	10,191	10,879
All other carloads	39,786	39,269	42,294
LCL traffic	190	216	233
Total cars loaded	**384,783**	**367,881**	**379,327**
Cumulative total,		1981	1980
17 weeks		**7,149,889**	**7,509,052**
Estimated revenue ton-miles (billions), 17 weeks		**16.2**	**17.7**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Apr. 18 totaled 31,016 cars (5.0% below the corresponding 1980 week) and 57,294 trailers or containers (down 3.5% from 1980). Cumulative volume for the first 16 weeks of 1981 is 510,980 cars (down 4.5% from 1980) and 927,336 trailers or containers (down 4.5% from 1980).

- *Indian Railways.*—Awarded a $2-million contract to Litton Unit Handling Systems of Cincinnati for a conveyor system for railroad wheel finishing. The system will convey 1,200-pound wheels at the rate of one wheel a minute; it is to be functioning by July 1982.

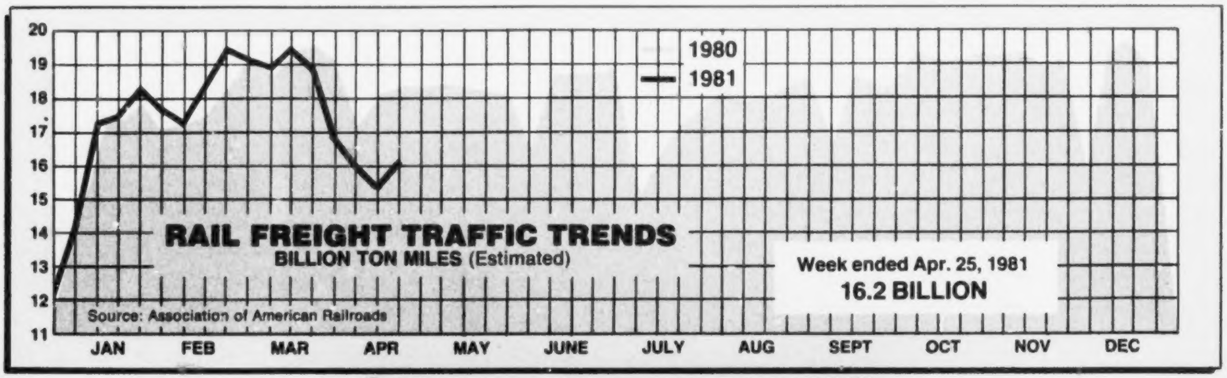
- *Kenya Railways Corp.*—Will use proceeds of a $58-million World Bank loan to help finance a $133.8-million improvement program. The program includes replacement of rail; purchases of track and workshop equipment; acquisition of hopper cars and spare parts for locomotives and cars; and yard improvements. Equipment and material financed by the loan will be obtained through international competitive bidding in accordance with World Bank guidelines except for orders under $100,000.

- *Port Authority Transit (Pittsburgh).*—Awarded three contracts with a total value in excess of $6.3 million to Bethlehem Steel for the supply of special track items, 10 portable track crossovers, and 1,270 tons of running rail for installation at the South Hill Village car yards and shop. A $7.46-million contract was awarded to the Massaro Corp. for construction of a building to accommodate a new maintenance center at South Hills Village. With the award of these contracts, approximately $25 million has now been commited to work on the South Hills Light Rail Transit (LRT) system.

- *Massachusetts Bay Transportation Authority.*—General Railway Signal is the apparent low bidder, at $14.2 million, for signaling the Harvard to Alewife extension of MBTA's Red Line. The GRS proposal includes high-frequency track circuits, preprogrammed train dispatching, supervisory control consoles with train and equipment status displays, a high-speed solid-state electronic data transmission system, an electronic car identity system, and automatic routing of trains.

- *Southern*—Awarded a $4.2-million contract to GTE for the supply and installation of microwave radio equipment and antenna systems at 40 sites between Albany, Ga., and Harriman, Tenn. This is the third phase of an ongoing program to upgrade Southern's microwave network.

- *Zimbabwe.*—Awarded a $40-million contract to General Motors for the supply of 25 2,250-hp diesel-electric locomotives and related services. The six-axle units are designated GT22LC. The purchase is being financed by a loan from the Kuwaiti Fund for Arab Development. The new locomotives, to be delivered this year, will replace units that have been leased from South African Railways.



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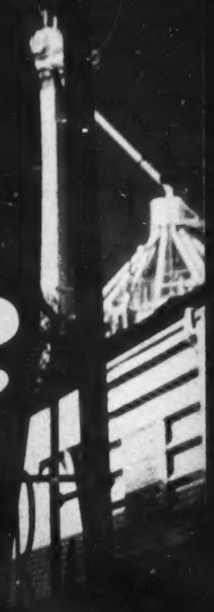

BUY—
OR LEASE?

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CONGRESSIONAL INFO SVC ###
SRI ACQUISITIONS ###
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RAILWAY AGE

May 25, 1981

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BUY—
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COVER: Photo by Roy H. Blanchard

Chessie: A new multi-mode plan

A through-service intermodal package involving movement by ocean, river, rail, and highway has been put together by Chessie and Dravo Mechling, the Dravo Corp.'s water-transport subsidiary.

The first shipment handled under the new plan consisted of 1,400 tons of steel. It moved by ocean vessel to New Orleans, by barge to a dock near Cincinnati, by rail (in 24 gondolas) to Plymouth, Mich., and by truck to the consignee.

"The combination of carriers is something we probably would not have considered a few years back," said Kenneth E. Mills, an assistant vice president in charge of the metals and minerals business group in Chessie's commercial department. "Now, after several years of planning, we have a solid intermodal concept where we can save shippers money.

"Before our multi-mode concept was worked out, the customer had to arrange the barge transfer and trucking service. Under this new set-up, Dravo Mechling and Chessie do all of this." A single rate is quoted for movement from New Orleans to the ultimate destination.

Conrail, Amtrak bills get moving

The Congressional tug-of-war over Conrail and Amtrak continues to be one of the more newsworthy contests set off by the Reagan Administration's cost-cutting blitz. The battle will extend well into the summer. While no clear-cut victory is indicated for either side, the cost-cutters seem likely to win more points than they will lose.

In the Republican-dominated Senate, the administration's Conrail bill has moved out of committee and awaits a floor vote. The administration, whose goal is to sell Conrail off to other railroads has an answer for those who claim that this will result in cherry-picking. The bill requires that Conrail lines be offered to prospective buyers in packages that would combine highly profitable routes with less attractive lines. Under the plan, any such transfer package would be subject to 160 days of public comment, Justice Department and ICC review, and final approval by the DOT secretary. Then Congress would have 120 days to act before the transfer would take place.

To make Conrail attractive on the market, the legislation would free the railroad of its Title V labor protection obligations, commuter train operations, unfavorable rate divisions, and some work rule provisions.

In the House, which is controlled by the Democrats, a bill sponsored by Rep. James J. Florio (D.-N.J.), contains many of the same provisions that are in the Senate bill—with the main difference that it would not provide for the automatic sell-off of Conrail. The House bill would give Conrail a chance to stay in business, although sell-off could occur if at stated mileposts the expected degree of turnaround had not taken place.

In an effort to forestall a Conrail "fire sale," railroad labor leaders agreed—subject to rank-and-file approval—to the deferral of about $229 million in annual wage increases over the next five years. While many more concessions would still have to be made by labor, including work rule reforms and reduction of Title V benefits, this action was viewed as a signal of labor's willingness to compromise.

As for Amtrak, one thing is already clear: It will not receive the $853 million FY1982 authorization it most recently requested. The Department of Transportation is sticking by its request for a budget of $613 million, and that figure held firm in legislation approved by a Senate committee on April 29. In its own bill, the corresponding House committee was, as expected, more generous, but the $725 million it approved on May 14 was far short of the Amtrak request. The $725 million, said Congressman Florio, "would provide a scaled down, leaner national system."

Under the administration-backed Amtrak bill, the railroad would be required to cover at least 50% of its operating costs in FY 1982—something Amtrak has already said it would do. The bill would also require that any state-supported 403(b) trains be funded by states for at least 20% of the avoidable loss in the first year, 35% in the second year, and 50% thereafter. Commuter service operated under contract in the corridor could be provided only if states or local governments pay all the costs.

The Florio bill, which is designed to minimize the route cutbacks Amtrak would have to make to live within a lower budget, would require the elimination of some sleeping and dining car services and the recovery of all costs of food and beverage service, now estimated to lose about $50 million in FY 1982.

1980 return: How 36 railroads fared

Class I railroads as a group earned a 4.25% return on investment in 1980, best showing in a quarter of a century. This was, of course, an average; some railroads did a lot better, some a lot worse. Below are the rates of return for individual carriers as reported by the ICC.

Railroad	Net Railway Operating Income (000 omitted)	Return on Net Investment (Percent)
Baltimore & Ohio	$51,186	3.85
Bessemer & Lake Erie	17,883	12.01
Boston & Maine	3,868	3.03
Chesapeake & Ohio	71,354	6.96
Conrail	(348,656)	-0-
Delaware & Hudson	(5,440)	-0-
Detroit, Toledo & Ironton	(4,022)	-0-
Elgin, Joliet & Eastern	4,493	4.12
Grand Trunk Western	(7)	-0-
Long Island	(9,952)	-0-
Norfolk & Western	199,089	9.64
Pittsburgh & Lake Erie	18,711	11.01
Western Maryland	6,653	4.69
Clinchfield	26,371	21.24
Florida East Coast	8,270	6.32
Illinois Central Gulf	(5,588)	-0-
Louisville & Nashville	71,688	5.76
Seaboard Coast Line	102,239	7.39
Southern	214,312	9.71
Atchison, Topeka & Santa Fe	177,435	7.64
Burlington Northern	172,831	5.63
St. Louis-San Francisco	37,606	6.57
Chicago & North Western	17,348	2.37
Milwaukee Road	(100,885)	-0-
Colorado & Southern	6,841	8.26
Denver & Rio Grande Western	33.023	9.86
Duluth, Missabe & Iron Range	8,234	7.08
Fort Worth & Denver	11,996	20.78
Kansas City Southern	25,563	8.94
Missouri-Kansas-Texas	10,601	6.54
Missouri Pacific	163,967	6.13
St. Louis Southwestern	31,539	6.66
Soo Line	35,123	10.02
Southern Pacific Transportation Co.	65,967	2.88
Union Pacific	214,351	8.58
Western Pacific	2,870	3.21

BUY—OR LEASE?

Reducing the guesswork

There are many ways to acquire a freight car—and for the unwary the decision-making path is full of unexpected twists. Railway Age asked two experts for some broad guidelines. This is their report.

By WALTER H. POGUE, JR.
and JOHN H. RUBEL

Railroad and shipping industry managers frequently face the issue of how best to finance freight cars after a decision to acquire has been made. Purchasing and leasing are broad categories of acquisition methods. Within those categories are variations that involve different costs and different returns.

Purchasing is an acquisition vehicle whereby ownership and use of the acquired cars reside in the same party. That party either takes title or has a call on the title at a fixed price. The owner/user depreciates the equipment. Leasing is an acquisition vehicle whereby ownership and use of acquired cars reside in different parties. The acquirer (lessee) neither takes title nor has a call on the title at a fixed price. The acquirer does not depreciate the equipment.

The selection process with its operating and financial considerations leads to an economic decision. It is incumbent upon decision makers to select the method of financing that maximizes the present value of net after-tax profit over the life of the equipment. The selection involves objectivity, subjectivity and risk assessment. Objectivity is the easy part. Subjectivity and risk assessment, at best, lead to educated guesses. An experienced analyst knows what *can* happen. Some know what *will* happen, but not *when*. Timing may not be everything but it is very important. Future events can affect the profitability of a transaction.

The decision making process is complicated today because there are more financing options available. Giant corporations, financial institutions, and doctors all want to be "your money supplier."

The acquirers fall into three broad classes: railroads, shippers, and operating leasing companies. All use cars as instruments with which to make money. However, each "uses" cars in different ways.

Trunk line railroads acquire cars primarily to profit from hauling freight. An ancillary purpose may be to correct negative imbalances in car hire payments. Some railroads have discovered that profits can be earned from owning a car fleet and keeping it off line. They have discovered additionally that the risk of relying on such profits is high.

Shippers acquire cars primarily to transport their own commodities. Normally such cars operate under private reporting marks and special operating rules. Railroads control the introduction of such cars by controlling the issuance of reporting marks and registration in the Universal Machine Language Equipment Register (UMLER). Railroads permit private cars to be introduced when they are unable or unwilling to furnish cars for a specific service. Shippers incorporate cars into their distribution systems. Economic returns are generated through greater market penetration and handling and storage savings.

Most privately marked car types are refrigerators, tanks, and covered hoppers.

In its earliest days, the refrigerator car was considered too special for railroads, and therefore private ownership was permitted. Subsequently, railroad owned private car lines were formed as entities to own and operate refrigerator car fleets.

The next specialized car to be developed was the tank car. Railroads never have seen fit to furnish tank cars, either directly or through railroad owned private car lines. Thus the great tank car leasing companies have flourished.

Finally, the covered hopper car was developed, initially for cement. Grain was still handled in box cars for a time until economics forced it into large covered hoppers. Today the covered hopper car fleet is divided between railroads and private owners, each acquiring cars as economics dictate. There is an ongoing debate as to whether railroads should supply the base requirement and shippers supply the peak demand or vice versa. There are, however, several specialized types of covered hoppers that railroads are leaving to the private owners. These are cars designed for plastic pellets and finely divided materials that require pneumatic assistance for unloading and contamination free containment.

There is a trend toward private ownership of other car types such as unit train coal and aggregate cars operating under contract rates and all-door box cars for handling building materials. Unit train coal car fleets are most likely to increase in number and assume an importance on a level with tank and covered hopper cars.

Operating leasing companies generate returns by profiting from the spread between financial ownership costs and rental rates. Prior to the 1960's, car types were confined mostly to tank and refrigerator. Now most car types are represented on the rosters of operating leasing companies and bear reporting marks of both private car lines and railroads. Operating leasing companies fall into two categories: railroad and non-railroad owned. Railroad owned leasing companies were founded primarily to furnish cars to their owners while gaining benefits from pooling and specialized car management. Rental rates are designed to provide a trade-off between low costs and profits sufficient to maintain a strong balance sheet in order to command attractive financing rates. Non-railroad owned operating leasing companies are in business to make a profit by taking risks and providing services that users do not wish to take or provide.

Each acquirer makes a selection of financing from the many options under the purchasing and leasing arrangements that are available.

- **The purchase option.** An acquirer selecting purchase can do so by paying cash or borrowing funds, or by some combination of both. Under a purchase arrangement the acquirer assumes all ownership responsibilities—financial obligations, maintenance, repair, property taxes, insurance and administration. The purchaser has title or call on title at a fixed price, can depreciate the equipment, and receives all tax benefits.

A cash purchase is unusual because sufficient cash seldom is available for large capital projects. Railroads, shippers and operating leasing companies might use cash under a certain combination of circumstances—e.g. cash is available from the sale of other assets; no other use for available cash at a higher return exists; or future borrowing costs would be lowered by increasing the fixed asset base without increasing debt.

A conditional or an installment sale is an arrangement under which a lending institution provides up to 100% of the purchase price. The acquirer takes title or has a call on title at a fixed price. A lease with an option to purchase at a fixed price is such a transaction. It is also called an "untrue" or "equity" lease. Payments are made over a fixed term and the loan is secured by the equipment. Cost of borrowing is predicated on credit standing of the acquirer. Lenders can be banks, insurance companies, pension funds or individual investors purchasing equipment trust certificates.

Railroads, shippers and operating leasing companies use this alternative if cash is not available or if cash can be put to work earning a higher return elsewhere. Additionally, the acquirer should be sufficiently profitable that tax benefits can be used to increase the return on investment.

● **The leasing alternative.** Leasing involves a greater degree of complexity than purchasing. Ownership and use reside in different parties, and assignment of ownership costs other than those associated with financing must be contractually defined with precision.

Leases are classified by length of term. A full payout lease, sometimes referred to as a capital lease, is one under which the sum of payments required by the lessee is sufficient to return the lessor's total investment in the equipment plus a profit. Conversely an operating lease is one under which the sum of payments required of the lessee is insufficient to return lessor's investment in the equipment.

Leases are classified also by which parties assume which ownership costs (other than financing). A net or triple net lease is one under which the lessee is responsible for rental payments to the lessor and for all other ownership costs, which include maintenance, repair, property taxes, insurance, administration, and movement and storage charges if incurred. A full service lease is one under which the lessor assumes responsibility for the financial and non-financial ownership costs. A third alternative is the modified net or modified service lease, under which the various non-financial ownership costs are assigned to the two parties on a negotiated basis for commercial and operating reasons.

The latter alternative was developed primarily in connection with short term leases of existing cars after leases to original lessees had expired. For example, the lessor might retain responsibility for basic structure integrity and the lessee assume responsibility for running repairs and damage. In other cases, lessors might assume responsibility for property taxes and insurance only. Any arrangement can be designed to fit the circumstances and interests of the parties engaged in a transaction.

For purposes of describing the various financial arrangements the basic kinds of

> ***"The choices can be narrowed considerably by determining first if need for equipment is short term or long term..."***

leases can be summarized in the form of a matrix.

	Full Payout	Operating
Net	A	B
Full Service	C	D

● **Full payout net lease.** A full payout net lease is a long term lease under which the lessee has use of the equipment for most of its useful life (not exceeding 80%) and assumes the non-financial ownership costs while under lease. This lease takes one of two forms. One is a leveraged lease under which the lessor borrows a significant portion of the acquisition cost without using his (lessor's) credit to obtain the borrowing. The borrowing is termed "non-recourse" (to lessor) and is obtained through a pledge by the lessor to the lender of the lessee's promise to pay rent, and by grant of a first lien on the equipment to the lender.

The other is a single investor lease under which the lessor uses his own funds to acquire the equipment. If a single investor lessor borrows funds to make an equipment acquisition, he does so through use of his own credit, not that of the lessee.

Railroads, shippers and operating leasing companies use full payout net leases. They do so as an alternative to ownership when it can be justified on an economic basis. The lessee makes the judgment that low cost per month or per quarter, and no money down, more than justify the loss of tax benefits and "residual" value at end of term.

Bank leasing companies and commercial finance companies are lessors. They perceive such investments as alternatives to long term loans. This type of investment is like a loan in that money is returned over time. It is unlike a loan in that not all of the profit is obtained from the excess of the borrower's repayment over the lender's investment. Some of the return comes through tax benefits associated with equipment ownership, e.g. investment tax credit and depreciation. Lessors look at full payout net leases as higher risk investments than loans (because of uncertainties associated with residual values and future tax benefits); but that higher risk is seldom reflected in more than a few percentage points of interest. Lessors of this type usually are passive in nature (that is, not active in the business of the lessee, just as a lender is not active in a borrower's business).

● **Net operating lease.** A net operating lease is a short term lease under which the lessee assumes non-financial ownership costs. Such leases are rare because lessors are reluctant to relinquish control of maintenance for cars that might be returned before the debt is repaid.

Railroads and shippers that have car management capabilities are most likely to choose this option if they perceive no long term need for the equipment.

Operating leasing companies, commercial finance companies, and sometimes manufacturers are lessors. These lessors offer net operating leases only if they feel confident that they will be able to find other users for the equipment after the original lease.

The term "net operating" lease has come into use in recent years. At one time an "operating" lease was synonymous with "full service" lease. The only leases then in use were net full payout and full service leases. Typically, railroads selected net payout leases and shippers leased cars from major private car lines on a full service basis.

● **Full service full payout.** This designation describes a long term lease whereby all acquisition costs, all non-financial ownership costs, and a profit are returned to the lessor during the lease. Usually the non-financial ownership costs are covered by either an escalation provision or cost plus arrangement. The relatively new "per diem" lease can fall in this classification.

Short line railroads and shippers are most likely to select full service full payout leases. They do so if they are unable or unwilling to manage their own equipment but wish to retain the equipment for most of its useful life.

Operating leasing companies normally are lessors. Should payout lease be with a good credit company as lessee and future remarketing requirement not likely, a passive leasing company could be lessor while contracting for service from one of the car management companies that now exist.

● **Full service operating lease.** Along with the net full payout lease, the full service operating lease is most widely used. The lessee has use of the equipment for a relatively short portion of its useful life. Maintenance management and all ownership costs are responsibilities of lessor.

Shippers and short line railroads are the most likely lessees.

Operating leasing companies normally are the lessors. They are capable of managing and remarketing the equipment when returned. Historically, returns to operating leasing companies have been high because of the high risks associated with non-payout leasing.

The road to a lease transaction can take many twists and turns. The arrangements described above are not all inclusive. Special circumstances sometimes result in unique arrangements. One certainly is that lending institutions must be protected in some manner. Sound financial health of the acquirer is preferred. Credit support from car builders, third party railroads, and shippers has been used. (The recent losses suffered by some lending institutions were the result of miscalculations, not the desire to assume inordinate risks.)

● **The decision process.** The options available within the leasing alternative are more numerous than those within the purchasing alternative. However, the choices can be narrowed considerably by determining first if need for equipment is short term or long term. The short term need generally eliminates the purchasing alternative. The long term need generally eliminates the short term full service leasing option.

The next consideration is ability of the acquirer to manage cars. Obviously, railroads have it. Shippers operating large car fleets can afford it.

Another consideration is balance sheet treatment of an equipment acquisition. Railcar acquisitions, other than those using cash, involve some form of financial liability. In exchange for ownership or use of an asset, a promise to make payments over a specified time period is made. The contractual obligation is a liability that takes its place along with other liabilities of the business enterprise.

Normally, short term leasing obligations are not treated as balance sheet liabilities. However, operating leases can involve substantial sums of money, and financial footnotes will call the attention of interested parties to those obligations.

Purchases and capital leases require balance sheet treatment. Both affect future borrowing and leasing capacities and their costs. An acquirer may wish to obtain expert legal and financial advice in determining the economic impact of each alternative form of financing as part of the analysis.

Once the needed term, car management, and balance-sheet questions are answered it is most probable that tax considerations will direct the acquirer to a selection of one of the options available.

● **A checklist.** When a railroad, a shipper, or an operating leasing company embarks on the evaluation process, many questions should be answered. Obviously, answers to some questions will differ with category of acquirer. Some of the questions pertaining to the acquiring company are:

—Is the need for equipment long or short term?

—What is the equipment likely to be worth when need for it no longer exists?

—Will equipment become obsolete within its useful life?

—Is there in-house car management capability?

—Is cash available for purchase?

—Are purchase funds available from borrowing sources?

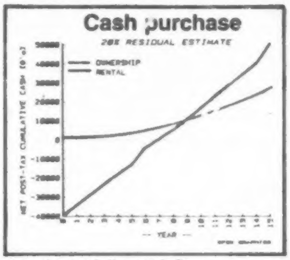
Buy or Lease — A case study

These tables and charts show three buy or lease comparisons for a freight car costing $40,000 with an economic life of 15 years. The variable for the different cases are the amounts of contributed and borrowed capital, and residual values estimated at 20% and at 50%. The residual values in these cases represent the user's estimate of the scrap or resale market value of the freight car after 15 years.

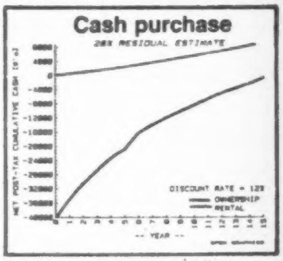
The decision to buy or lease is based on net present value analysis for each of the test case comparisons. On the theory that a dollar in hand today is worth more than the promise of a dollar at some future time, net present value analysis examines the present value of all outlays and inflows of funds over the economic term of the transaction. Buy or lease decisions are made on the sets of assumptions producing the highest net present value after 15 years. The following basic assumptions apply to all of the purchase cases:

- The freight car will generate an economic benefit (revenue or saving) to the user of $425 per month, and this benefit will grow by 6% per year.
- If the car is purchased with borrowed funds, they will be repaid over 15 years at 14% interest.
- If the car is purchased, it is depreciated over 12 years on the double declining method, switching to straight line in 7th year.
- The user pays income taxes at a 46% marginal rate, and does not use the investment tax credit arising from purchase until the sixth year.

Year	Revenue or Saving	Net Income	Depreciation	Taxable Net Income	Income Tax @46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	-40,000	-40,000	0	-40,000	0	0	0	
1	5,100	5,100	6,667	-1,567	-721	5,821	-34,179	-34,803
2	5,406	5,406	5,556	-150	-69	5,475	-28,705	-30,439
3	5,730	5,730	4,630	1,101	506	5,224	-23,481	-26,720
4	6,074	6,074	3,858	2,216	1,019	5,055	-18,426	-23,508
5	6,439	6,439	3,215	3,224	1,483	4,956	-13,470	-20,696
6	6,825	6,825	2,679	4,146	-2,093	8,918	-4,552	-16,178
7	7,234	7,234	2,233	5,002	2,301	4,934	382	-13,946
8	7,669	7,669	2,233	5,436	2,500	5,168	5,550	-11,859
9	8,129	8,129	2,233	5,896	2,712	5,416	10,966	-9,905
10	8,616	8,616	2,233	6,384	2,936	5,680	16,646	-8,077
11	9,133	9,133	2,233	6,901	3,174	5,959	22,605	-6,364
12	9,681	9,681	2,233	7,449	3,426	6,255	28,860	-4,758
13	10,262	10,262	0	10,262	4,721	5,542	34,401	-3,488
14	10,878	10,878	0	10,878	5,004	5,874	40,275	-2,286
15	19,531	19,531	0	19,531	8,984	10,547	50,822	-359



Actual cumulative cash flow

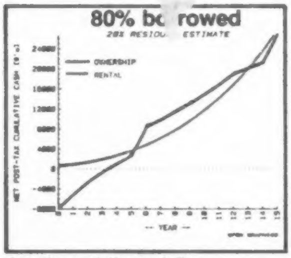


Discounted cash flow providing 12% return on investment

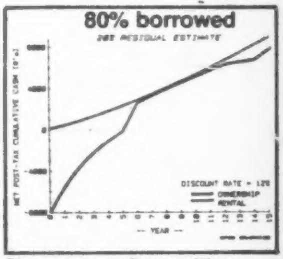
Case 1a.
- 100% cash purchase
- 20% residual value

Net present value:
Buy: −$359 Lease: $8,811
Decision is to LEASE

Year	Revenue or Savings	Payment	Net Income	Depreciation	Interest	Taxable Net Income	Income Tax @46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	-8,000	0	-8,000	0	0	-8,000	0	0	0	
1	5,100	5,114	-14	6,667	4,438	-6,004	-2,762	2,748	-5,252	-5,546
2	5,406	5,114	292	5,556	4,337	-4,486	-2,064	2,356	-2,896	-3,668
3	5,730	5,114	616	4,630	4,221	-3,120	-1,435	2,052	-844	-2,208
4	6,074	5,114	960	3,858	4,087	-1,871	-861	1,821	977	-1,051
5	6,439	5,114	1,325	3,215	3,934	-710	-327	1,651	2,628	-114
6	6,825	5,114	1,711	2,679	3,758	388	-3,821	5,533	8,161	2,689
7	7,234	5,114	2,121	2,233	3,555	1,447	665	1,455	9,616	3,348
8	7,669	5,114	2,555	2,233	3,322	2,113	972	1,582	11,198	3,987
9	8,129	5,114	3,015	2,233	3,055	2,841	1,307	1,708	12,906	4,603
10	8,616	5,114	3,502	2,233	2,747	3,636	1,673	1,830	14,736	5,192
11	9,133	5,114	4,019	2,233	2,394	4,507	2,073	1,946	16,682	5,751
12	9,681	5,114	4,567	2,233	1,988	5,461	2,512	2,055	18,738	6,279
13	10,262	5,114	5,148	0	1,521	8,741	4,021	1,127	19,865	6,537
14	10,878	5,114	5,764	0	984	9,984	4,551	1,213	21,078	6,785
15	19,531	5,114	14,417	0	368	19,163	8,185	5,602	26,680	7,809



Actual cumulative cash flow

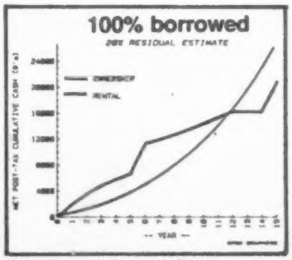


Discounted cash flow providing 12% return on investment

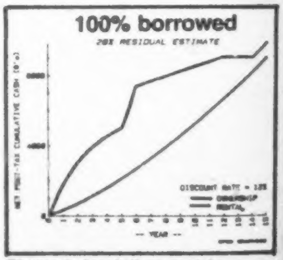
Case 2a.
- Purchase with 20% cash and 80% borrowed funds
- 20% residual value

Net present value:
Buy: $7,809 Lease: $8,811
Decision is to LEASE

Year	Revenue or Savings	Payment	Net Income	Depreciation	Interest	Taxable Net Income	Income Tax @46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	0	0	0	0	0	0	0	0	0	
1	5,100	6,392	-1,292	6,667	5,547	-7,114	-3,272	1,980	1,980	1,768
2	5,406	6,392	-986	5,556	5,421	-5,570	-2,562	1,576	3,556	3,024
3	5,730	6,392	-662	4,630	5,276	-4,175	-1,921	1,259	4,815	3,920
4	6,074	6,392	-318	3,858	5,109	-2,893	-1,331	1,013	5,827	4,564
5	6,439	6,392	46	3,215	4,917	-1,694	-779	825	6,653	5,032
6	6,825	6,392	433	2,679	4,697	-551	-4,254	4,686	11,339	7,406
7	7,234	6,392	842	2,233	4,444	558	257	585	11,924	7,671
8	7,669	6,392	1,276	2,233	4,153	1,283	590	686	12,610	7,948
9	8,129	6,392	1,736	2,233	3,819	2,077	956	781	13,391	8,230
10	8,616	6,392	2,224	2,233	3,434	2,949	1,357	867	14,258	8,509
11	9,133	6,392	2,741	2,233	2,992	3,908	1,798	943	15,201	8,780
12	9,681	6,392	3,289	2,233	2,485	4,964	2,283	1,006	16,207	9,038
13	10,262	6,392	3,870	0	1,901	8,361	3,846	24	16,231	9,038
14	10,878	6,392	4,486	0	1,230	9,648	4,438	48	16,278	9,053
15	19,531	6,392	13,138	0	459	19,071	8,773	4,366	20,644	9,851



Actual cumulative cash flow



Discounted cash flow providing 12% return on investment

Case 3a.
- 100% borrowed funds
- 20% residual value

Net present value:
Buy: $9,851 Lease: $8,811
Decision is to BUY

—Can the balance sheet tolerate the amount of debt assumption required to finance the equipment?

—Are there more productive uses for cash and/or funds available from borrowing lines?

—Are tax benefits associated with equipment ownership useful?

The answer to these questions may sometimes be absolute. The overall answer, however, is seldom absolute until the following additional question is asked:

—Does another party perceive the risks and returns of ownership in a different manner, with the result that the acquirer can enjoy a lower cost of using the equipment if ownership were to reside in that party?

This is known as the "arbitrage" question. (Arbitrage is defined by Webster as

Lease Basis

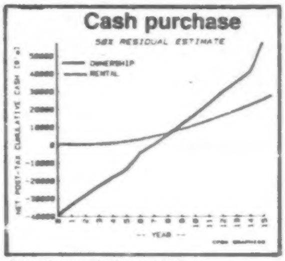
The table to the right shows the flow of funds when the freight car is leased on a 15 year net lease at $385 per month. All of the purchasing cases shown below are compared to this case and the buy or lease decision is measured against this net present value of $8,811 after 15 years.

Year	Revenue or Saving	Lease Cost	Taxable Net Income	Income Tax @ 46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
1	5.100	4.620	480	221	259	259	**231**
2	5.406	4.620	786	362	424	684	**570**
3	5.730	4.620	1.110	511	600	1.283	**997**
4	6.074	4.620	1.454	669	785	2.068	**1,496**
5	6.439	4.620	1.819	837	982	3.051	**2,053**
6	6.825	4.620	2.205	1,014	1.191	4.241	**2,656**
7	7.234	4.620	2.614	1.203	1.412	5.653	**3,295**
8	7.669	4.620	3.049	1.402	1.646	7.299	**3,960**
9	8.129	4.620	3.509	1.614	1.895	9.194	**4,643**
10	8.616	4.620	3.996	1.838	2.158	11.352	**5,338**
11	9.133	4.620	4.513	2.076	2.437	13.789	**6,038**
12	9.681	4.620	5.061	2.328	2.733	16.522	**6,740**
13	10.262	4.620	5.642	2.595	3.047	19.569	**7,438**
14	10.878	4.620	6.258	2.879	3.379	22 948	**8,130**
15	11.531	4.620	6.911	3.179	3.732	26.680	**8,811**

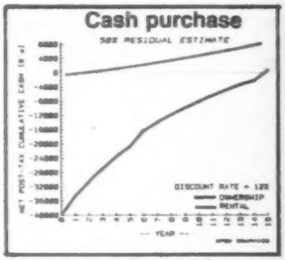
Summary

	User expects	
Capital source	20% Residual value	50% Residual value
1. 100% cash	Lease	Lease
2. 20% cash 80% borrowed	Lease	Buy
3. 100% borrowed	Buy	Buy

Year	Revenue or Saving	Net Income	Depreciation	Taxable Net Income	Income Tax @46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	-40.000	-40.000	0	-40.000	0	0	0	
1	5.100	5.100	6.667	-1.567	-721	5.821	-34.179	**-34,803**
2	5.406	5.406	5.556	-150	-69	5.475	-28.705	**-30,439**
3	5.730	5.730	4.630	1.101	506	5.224	-23.481	**-26,720**
4	6.074	6.074	3.858	2.216	1.019	5.055	-18.426	**-23,508**
5	6.439	6.539	3.215	3.224	1.483	4.956	-13.470	**-20,696**
6	6.825	6.825	2.679	4.146	-2.093	8.918	-4.552	**-16,178**
7	7.234	7.234	2.233	5.002	2.301	4.934	382	**-13,946**
8	7.669	7.669	2.233	5.436	2.500	5.168	5.550	**-11,859**
9	8.129	8.129	2.233	5.896	2.712	5.416	10.966	**-9,905**
10	8.616	8.616	2.233	6.384	2.936	5.680	16.646	**-8,077**
11	9.133	9.133	2.233	6.901	3.174	5.959	22.605	**-6,364**
12	9.681	9.681	2.233	7.449	3.426	6.255	28.860	**-4,758**
13	10.262	10.262	0	10.262	4.721	5.542	34.401	**-3,488**
14	10.878	10.878	0	10.878	5.004	5.874	40.275	**-2,286**
15	31.531	31.531	0	31.531	14.504	17.027	57.302	**825**



Actual cumulative cash flow

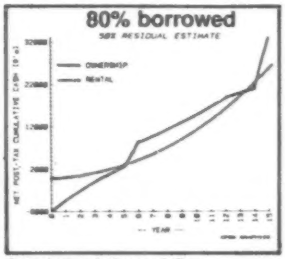


Discounted cash flow providing 12% return on investment

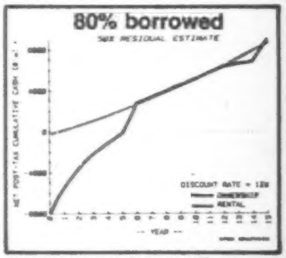
Case 1b.
- 100% cash purchase
- 50% residual value

Net prevent value:
Buy: $825 Lease: $8,811
Decision is to LEASE

Year	Revenue or Savings	Payment	Net Income	Depreciation	Interest	Taxable Net Income	Income Tax @46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	-8.000	0	-8.000	0	0	-8.000	0	0	0	
1	5.100	5.114	-14	6.667	4.438	-6.004	-2.762	2.748	-5.252	**-5,546**
2	5.406	5.114	292	5.556	4.337	-4.486	-2.064	2.356	-2.896	**-3,668**
3	5.730	5.114	616	4.630	4.221	-3.120	-1.435	2.052	-844	**-2,208**
4	6.074	5.114	960	3.858	4.087	-1.871	-861	1.821	977	**-1,051**
5	6.439	5.114	1.325	3.215	3.934	-710	-327	1.651	2.628	**-114**
6	6.825	5.114	1.711	2.679	3.758	388	-3.821	5.533	8.161	**2,689**
7	7.234	5.114	2.121	2.233	3.555	1.447	665	1.455	9.616	**3,348**
8	7.669	5.114	2.555	2.233	3.322	2.113	972	1.582	11.196	**3,987**
9	8.129	5.114	3.015	2.233	3.055	2.841	1.307	1.708	12.906	**4,603**
10	8.616	5.114	3.502	2.233	2.747	3.636	1.673	1.830	14.736	**5,192**
11	9.133	5.114	4.019	2.233	2.394	4.507	2.073	1.946	16.682	**5,751**
12	9.681	5.114	4.567	2.233	1.988	5.461	2.512	2.055	18.738	**6,279**
13	10.262	5.114	5.148	0	1.521	8.741	4.021	1.127	19.865	**6,537**
14	10.878	5.114	5.764	0	984	9.894	4.551	1.213	21.078	**6,785**
15	31.531	5.114	26.417	0	368	31.163	14.335	12.082	33.160	**8,993**



Actual cumulative cash flow

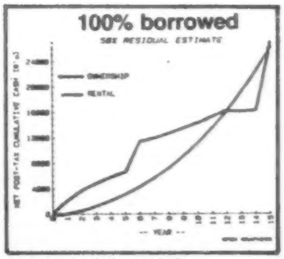


Discounted cash flow providing 12% return on investment

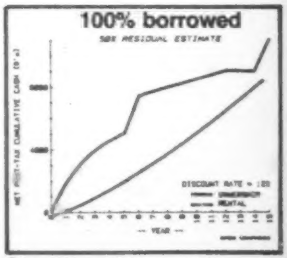
Case 2b.
- Purchase with 20% cash and 80% borrowed funds
- 50% residual value

Net present value:
Buy: $8,993 Lease: $8,811
Decision is to BUY

Year	Revenue or Savings	Payment	Net Income	Depreciation	Interest	Taxable Net Income	Income Tax @ 46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	0	0	0	0	0	0	0	0	0	
1	5.100	6.392	-1.292	6.667	5.547	-7.114	-3.272	1.980	1.980	**1,768**
2	5.406	6.392	-986	5.556	5.421	-5.570	-2.562	1.576	3.556	**3,024**
3	5.730	6.392	-662	4.630	5.276	-4.175	-1.921	1.259	4.815	**3,920**
4	6.074	6.392	-318	3.858	5.109	-2.893	-1.331	1.013	5.827	**4,564**
5	6.439	6.392	46	3.215	4.917	-1.694	-779	825	6.653	**5,032**
6	6.825	6.392	433	2.679	4.697	-551	-4.254	4.686	11.339	**7,406**
7	7.234	6.392	842	2.233	4.444	558	257	585	11.924	**7,671**
8	7.669	6.392	1.276	2.233	4.153	1.283	590	686	12.610	**7,948**
9	8.129	6.392	1.736	2.233	3.819	2.077	956	781	13.391	**8,230**
10	8.616	6.392	2.224	2.233	3.434	2.949	1.357	867	14.258	**8,509**
11	9.133	6.392	2.741	2.233	2.992	3.908	1.798	943	15.201	**8,780**
12	9.681	6.392	3.289	2.233	2.485	4.964	2.283	1.006	16.207	**9,038**
13	10.262	6.392	3.870	0	1.901	8.361	3.846	24	16.231	**9,043**
14	10.878	6.392	4.486	0	1.230	9.648	4.438	48	16.278	**9,053**
15	31.531	6.392	25.138	0	459	31.071	14.293	10.846	27.124	**11,035**



Actual cumulative cash flow



Discounted cash flow providing 12% return on investment

Case 3b.
- 100% borrowed funds
- 50% residual value

Net present value:
Buy: $11,035 Lease: $8,811
Decision is to BUY

"Before leveraged leasing appeared, concern with market values lay primarily with those of cars ready for retirement..."

"simultaneous purchase and sale of the same or equivalent security in order to profit from price discrepancies.") The answer sometimes is clear, sometimes cloudy. An acquirer currently not paying federal income taxes might conclude that another party that is paying those taxes would consider the risks and returns of ownership in a manner that would reduce the cost of using the equipment. Again "reducing the cost" means that relatively more after-tax, present value dollars are retained if an alternate means of financing is employed.

An acquirer can answer the arbitrage question by comparing the after-tax return expected from ownership with after-tax returns expected by various types of lessors.

The case study (pp. 38-39) describes graphically several lease versus purchase arbitrage analyses.

As an example of the lessor's side of an arbitrage, the following are expected after-tax returns on investment as perceived by the lessor:

	Full Payout	Operating
Net	8% to 15%	10% to 15%
Full Service	12% to 30%	12% to 30%

These returns may or may not be sufficient for an acquirer, but an equipment user contemplating the arbitrage question as it relates to alternative sources of financial resources should consider the lessors' expected return on investment. If the acquirer has projects returning more than lessors' expected returns, after-tax net might be improved by leasing cars and applying available funds to those projects.

Conversely, lessors' expectations of residual values may work against leasing and in favor of purchasing. Matrix below shows lessors' expected residual values in freight cars after 15 years.

	Full Payout	Operating
Net	15% to 25%	25% to 55%
Full Service	25% to 55%	25% to 55%

These percentages are residual values after 15 years as a percentage of original acquisition costs.

An acquirer when contemplating the arbitrage question as it relates to future residual or market value may find that his expectations are higher than those of lessors and may decide to purchase rather than lease.

● **Market values in retrospect.** Before leveraged leasing appeared, concern with market values lay primarily with those of cars ready for retirement. Residual values were those amounts offered by scrap dealers or industrial users acquiring non-interchange cars for plant use.

With the advent of leveraged leasing, the residual value of an asset became an ingredient in the calculation establishing rate of return to a lessor. The owner's expected rate of return can be adjusted by changing the assumed residual value. In turn, the owner's desired rate of return along with the senior lender's required interest rate establishes the level of lease payments. Therefore, assumed residual value is one of several factors that determine the cost of choosing the leveraged leasing alternative.

In a "true lease," the lessee has no equity. The lessee normally is given an option to purchase equipment at the end of the initial term for an amount equal to "fair market value." At that time "fair market" and "residual" values are synonymous.

Since leveraged leasing began during the early 1960's and initial terms typically were for 15 years, expirations have been experienced since the late 1970's. Problems associated with lease expirations and establishment of "fair market values" have surfaced recently.

Most early leveraged leasing deals were between railroads and passive lessors having no intention or interest in participating in operating businesses. Many lease expirations were followed by renewals at nominal lease rates that were mutually agreed upon by the parties. Therefore the process of soliciting bids on which to establish fair market values was not normally practiced. The problems described below did not surface until lessors began to desire conversion of rolling stock assets into cash. This is a recent development, perhaps brought on by perceptions that higher returns are available in other investments.

One problem is establishment of lessees' contractual obligations to restore cars to conditions based on whatever standards were prescribed when leases were originated. Maintenance standards designed to qualify cars for interchange service are precise. However, leases generally require that cars be returned in original condition plus any modifications or additions required by regulatory agencies less "ordinary wear and tear." What constitutes "ordinary wear and tear" is many times debatable. Accurate definition would require establishment of measurable wear and corrosion limits for each component subject to such forms of deterioration. Language in typical lease contracts leaves the subject mentioned only in the most general terms. Present practice is to negotiate settlement between the parties based on joint inspections and business considerations.

A problem for lessees is that maintenance monies spent during lease terms tend to enhance fair market values, especially if cars are reconditioned during the later years of the terms. Prospective purchasers and lessees offer bids based on economic values to them of cars fit for their services. Bids are discounted by amounts necessary to meet their requirements. Therefore, lessees have incentives to do as little as possible to cars until after they have purchased them or renewed the leases. Otherwise they are spending monies twice, once in maintenance and again in incremental acquisition prices.

A problem for lessors that tends to work in favor of lessees is the normal provision that the lessee has "right of first refusal" to meet the highest bid from prospective acquirers. This tends to diminish fair market value in that it discourages bidding. Prospective acquirers are reluctant to spend time, money, and effort to inspect cars, prepare bids, and arrange financing if they feel that it is likely that lessees will keep the equipment.

Market values are influenced by regulatory requirements pertaining to cars that change ownership after age 20. Prior to age 21, cars may change ownership with no additions or modifications other than those required to correct defects as prescribed by the AAR Interchange Rules. From age 21 until the maximum age of 40 is reached, cars changing ownership and going into interchange service must meet the requirements of AAR Mechanical Rule 33. Three costly requirements can be stabilized trucks, welded train lines, and addition of slack adjusters. Another provision is that, after cars reach the age of 26, they may not be rebuilt and receive a zero built date for AAR car hire purposes. Because of these requirements, market values tend to drop precipitously at ages 21 and 26, respectively.

Lessors sometimes find that they can enhance fair market values of cars they desire to remarket by providing more attractive financing than available to cash buyers having to obtain financing from other sources.

● **Lessons from recent history.** Although the future is seldom like the past, a look at the experience of those recently

"It is now evident that 50-foot boxcar and grain covered hopper car fleets have been overbuilt..."

dealing in residual value situations might be useful. The first observation is that there are few predictable patterns in market values of secondhand cars. Wide fluctuations have been occurring by car type and market demand at various times.

In less than one year market prices for small-cube covered-hopper cars between 20 and 25 years of age rose from slightly above scrap value to approximately three times scrap value. Following refurbishing, the same covered hopper cars were selling for export to Mexico at approximately two and one-half times original cost.

At times during the past five years, boxcars, hopper cars, and covered hopper cars have commanded market prices well in excess of original cost. At other times it was difficult to find buyers at all.

The acquirer that purchased rather than leased is seldom concerned with fair market values after initial financial obligations are satisfied. Such a company is not faced with the problems associated with lease terminations. Neither is it faced with the prospect of having to make replacements at new car prices. On the other hand more profit may have been made on the cars by taking advantage of lower cost financing. There was no way of knowing for sure at the time evaluations of alternatives were made.

Up to this point, reference has been made to market values during the period following satisfaction of initial financing. Recent events have increased interest in market values during the early years of equipment life.

The tendency to overreact to demands for products and services is typical of the business community. It is now evident that 50-foot boxcar and grain covered hopper car fleets have been overbuilt.

Attracted by tax benefits and prospects for long term demands, corporate and individual investors entered the market as lessors, bidding the market prices of new cars up at least 5% over what they would have been had only railroads and established private car lines been in the market. When demand precipitously evaporated, new car prices dropped approximately 12% rather than the typical 7% that the industry had been experiencing during previous low demand periods.

Market prices for secondhand boxcars younger than five years of age dropped along with the prices of new cars, but by greater percentages. In some instances available buyers were willing to pay prices that represented only 50% of prices paid by lessors near the end of the peak demand period. Relatively few such transactions have been completed, however. Most lessors are attempting to maintain ownership, hoping for a return of demand.

While boxcar lessors were leasing to short line railroads on "per diem" or "utilization" leases with no guarantees, grain covered hopper lessors were leasing to shippers on five-year secure or operating lease contracts. Few relatively new secondhand covered hopper cars have been on the market. It is not possible now to predict market values when the initial leases expire. Most lessors will prefer to continue leasing in order to preserve all tax benefits. Should the leasing demand be weak and cars placed on the market for sale, market values will fall.

It is clear that the most difficult part of projecting after-tax, present value is deciding what future value to incorporate in the analysis. There is no question that such projections are imprecise. It is a matter of degree.

● **Looking ahead.** The task of making the analysis of the alternative forms of purchasing and leasing is increasingly difficult. Determining needs for the next five years is difficult; determining needs for the next 15 years is next to impossible. Business decisions resulting from deregulation will affect needs as will rail restructuring, energy costs, and interest rate levels.

From a major railroad's perspective certain car types always will be required. Financing those types will involve both purchasing and net payout leasing, depending on when and how many cars are acquired. Since cash now is worth more than cash later, this analysis will be little affected by future residual values.

From a shipper's perspective the task is even more difficult than that of a railroad. Deregulation, line abandonments, changes in railroads' policies regarding introduction of private cars, obsolescence—all are factors relating to future needs. One favorable trend, however, is toward long term contracts involving customers, carriers, and shipper-furnished equipment. As with railroads, long term needs will lead shippers to purchasing, net payout leasing, and in some instances full service leasing. Again residual value assessment will be less important than profitability in the early years. For equipment not subject to long term contracts, full service and net operating leases will be selected. Lease terms of less than five years will be preferred, covering equipment already existing. Short term contracts covering new cars (prior to construction) will be very expensive due to lessors' assumptions of increasingly greater risks.

Operating leasing companies will choose between purchasing and net payout leasing as in the past. Again focus will be on relative profitability in the early years.

The future of the boxcar is more in doubt than ever before. The irony is that boxcars are more capital- and fuel-efficient in line-haul operations than piggyback cars and trailers. The advantages are lost because of transit times and terminal costs.

Railroads always will have a major share of the coal-hauling market. As coal terminals incorporating ground storage facilities are developed, more unit trains of quick-dump cars will be required.

Covered hopper and tank cars probably are the safest investments in rail equipment. Except for those handling corrosive commodities, their useful lives tend to be longest because they receive the least abuse. They are least subject to obsolescene.

Each car type should be examined in the analysis of alternative methods of financing in light of potential obsolescence, trends in utilization, degree of expected abuse, and its future in the rail mode.

The analysis leading to the selection of one of the many alternatives within the purchasing and leasing options probably is one of the most difficult faced by most business managers. Assumptions pertaining to future events must be made. However, a thorough analysis involves making those assumptions. Good business managers seek and draw upon the best sources of experience in each of the disciplines related to rail equipment operations, management, and financing. The information is available if the manager is determined to find it. ■

About the authors

Walter H. Pogue, Jr., (MBA, Harvard, 1955; B.S.C.E., VPI, 1950), heads his own firm, Railroad Equipment Supply and Consulting Associates, Lancaster, Pa. His career has included stints as president of Berwick Forge & Fabricating, and general manager, Freight Car Division, General American Transportation Corp.

John H. Rubel (MBA, Chicago, 1971; B.A., Econ., Notre Dame, 1970), was vice president and controller, North American Car Corp., 1977-1978; he subsequently founded CAP-FORM, Inc., which was recently acquired by Emons Leasing, of which Mr. Rubel is now vice president-marketing.

Market

CARLOADINGS

Loadings of revenue freight in the week ended May 2 totaled 396,029 cars, according to the Association of American Railroads. This was a decrease of 61,915 cars, or 13.5%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended May 2 are estimated at 16.6 billion, a decrease of 6.5% below the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity		**May 2 week**
Grain		23,319
Farm products		3,968
Metallic ores		32,453
Coal		61,244
Crushed stone, gravel & sand		14,780
Nonmetallic minerals		14,967
Grain mill products		14,552
Food and kindred products		16,583
Primary forest products		19,455
Lumber and wood products (except furniture)		10,207
Pulp, paper and allied products		20,762
Chemicals and allied products		28,789
Petroleum products		5,003
Stone, clay and glass products		15,248
Coke		6,980
Metals & products		19,370
Motor vehicles & equipment		20,406
Waste & scrap materials		13,836
Forwarder & shipper assn. traffic		11,066
All other carloads		42,834
LCL traffic		207
Total cars loaded		**396,029**
Cumulative total	1981	1980
18 weeks	**7,546,514**	**7,966,996**
Estimated revenue ton-miles (billions), 18 weeks	**315.9**	**319.7**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Apr. 25 totaled 31,461 cars (2.6% below the corresponding 1980 week) and 55,778 trailers or containers (down 5.9% from 1980). Cumulative volume for the first 17 weeks of 1981 is 542,441 cars (down 4.4% from 1980) and 983,114 trailers or containers (down 4.6% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Apr. 14 totaled 4.9 million tons (down 1.1% from 1980). Cars loaded totaled 73,342 (up 0.2% from 1980). Cumulative loadings for 1981 were up to 71.3 million tons (up 0.9 from 1980).

- *American Electric Power Systems.*—Signed a long-term contract with PLM Railcar Maintenance Co. under which PLM will maintain 1,600 AEP open-top coal hoppers at its Alliance, Neb., shop. This brings to 4,300 the number of cars now maintained under contract at Alliance. PLM also maintains 1,600 AEP coal cars in the East.

- *Guatemala Railways.*—Ordered 10 2,000-hp diesel-electric units from Bombardier at a total cost of approximately $14 million.

- *Southern Pacific.*—Placed an $8-million order with ACF for 42 five-unit, articulated, double-stack container cars for delivery starting in July. Designed by SP and ACF, each of the new 270-ft cars can carry 10 containers (*RA*, Mar. 30, p. 35).

- *Toronto Transit Commission.*—Awarded a $1-million contract to RMS Industrial Controls Inc. of Port Moody, B.C., for the supply of radio remote terminal units to be used in TTC's automated vehicle monitoring system.

- *Freight cars and locomotives.*—The following report has been received from the AAR and the ARCI.

DELIVERED

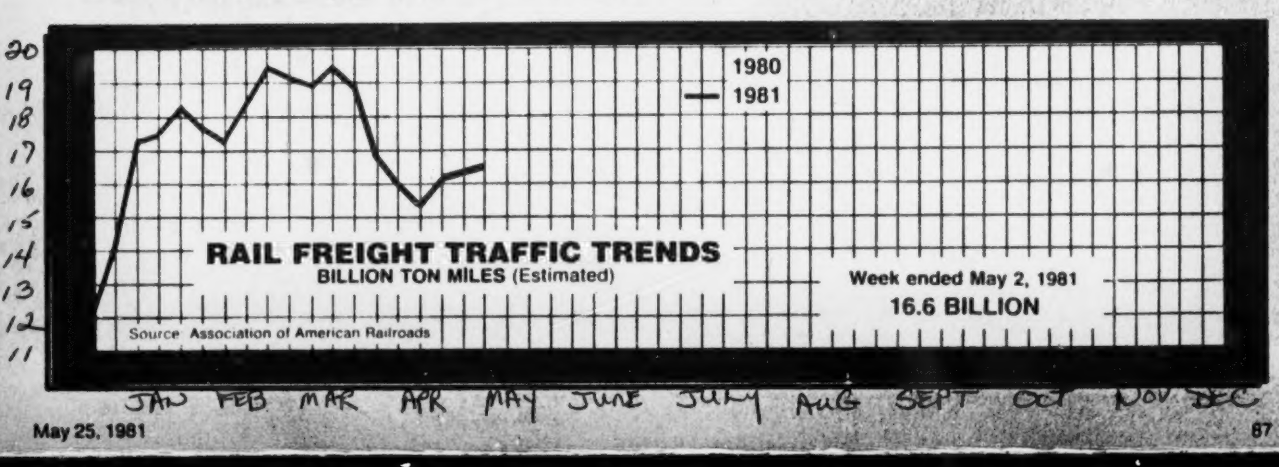
	March		**February**	**Three Months**	
	1981	**1980**	**1981**	**1981**	**1980**
Built new by carbuilders	4,718	8,224	4,401	14,183	22,870
Built new in RR shops	444	571	308	1,024	1,462
Built new—total	5,162	8,795	4,709	15,207	24,332
Rebuilt	136	222	150	321	426
TOTAL DELIVERED	**5,298**	**9,017**	**4,859**	**15,528**	**24,758**
Locomotives (new and rebuilt)	92	246	67	188	539

ORDERED

	March		**February**	**Three Months**	
	1981	**1980**	**1981**	**1981**	**1980**
To be built new by carbuilders	1,559	3,471	2,069	5,865	13,357
To be built new in RR shops	0	0	0	0	0
To be built new—total	1,559	3,471	2,069	5,865	13,357
To be rebuilt	300	68	0	600	833
TOTAL ORDERED	**1,859**	**3,539**	**2,069**	**6,465**	**14,190**

ON ORDER AND UNDELIVERED

	April 1		**March 1**	**Average backlog**	
	1981	**1980**	**1981**	**1981**	**1980**
To be built new by carbuilders	38,059	96,165	41,197	41,158	103,328
To be built new in RR shops	3,480	4,790	3,924	3,879	5,325
To be built new—total	41,539	100,955	45,121	45,037	108,653
To be rebuilt	279	507	115	220	642
TOTAL ON ORDER	**41,818**	**101,462**	**45,236**	**45,257**	**109,295**
Locomotives (new and rebuilt)	411	1,114	471	468	1,230



RAIL FREIGHT TRAFFIC TRENDS
BILLION TON MILES (Estimated)

Source: Association of American Railroads

Week ended May 2, 1981
16.6 BILLION

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Airport rail lines:
A right way—and a wrong way

June 8, 1981

RAILWAY AGE

Miami transit: On schedule, on budget

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RAILWAY AGE

June 8, 1981

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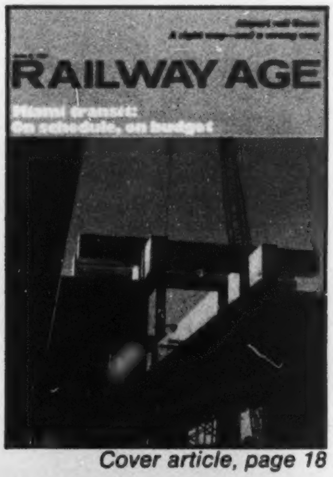

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18 Miami transit: On schedule, on budget
Construction of the Stage 1, 20½-mile, 20-station, elevated line is now close to the one-third point—and the $867-million project is within its original budget and on schedule for a planned 1984 opening.

26 Airport rail lines: A wrong way, a right way
Around 20 major cities now have airport rail access. Some have done it well—among them, Zurich and Frankfurt—and some not so well: Washington, Mexico City, and Paris. This article explores the differences.

30 Rail/community conflicts: A new approach
Working closely with the Burlington Northern, the states of Minnesota and North Dakota have sought to devise ways to reduce these conflicts. What they have come up with has attracted nationwide attention. Here's why.

34 Electrification: Who will be first?
In the last 20 years, railroads throughout the world have electrified 60,000 miles of line, of which only 120 miles have been in the U.S. Several roads are far advanced with studies; the big problem is high initial cost.

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COVER: Miami transit construction photo by William D. Middleton

Market

CARLOADINGS

Loadings of revenue freight in the week ended May 9 totaled 383,051 cars, according to the Association of American Railroads. This was a decrease of 60,698 cars, or 13.7%, compared with the corresponding week last year. The sharp decline was primarily attributable to the impact of the United Mine Workers' strike. Ton-miles generated by carloadings in the week ended May 9 are estimated at 16.0 billion, a decrease of 9.0% below the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity		**May 9 week**
Grain		21,316
Farm products		4,196
Metallic ores		31,585
Coal		61,093
Crushed stone, gravel & sand		14,496
Nonmetallic minerals		14,459
Grain mill products		14,522
Food and kindred products		15,884
Primary forest products		19,281
Lumber & wood products (except furniture)		8,769
Pulp, paper & allied products		19,821
Chemicals & allied products		28,154
Petroleum products		5,315
Stone, clay & glass products		14,759
Coke		7,309
Metals & products		16,977
Motor vehicles & equipment		19,557
Waste & scrap materials		13,457
Forwarder & shipping assn. traffic		10,596
All other carloads		41,312
LCL trafic		193
Total cars loaded		**383,051**
Cumulative total,	1981	1980
19 weeks	**7,929,565**	**8,410,745**
Estimated revenue ton-miles (billions), 19 weeks	**16.0**	**17.6**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week end May 2 totaled 32,044 cars (2.6% below the corresponding 1980 week) and 61,825 trailers or containers (up 3.2% from 1980). Cumulative volume for the first 18 weeks of 1981 is 573,343 (down 4.5% from 1980) and 1,044,939 trailers or containers (down 4.1% from 1980).

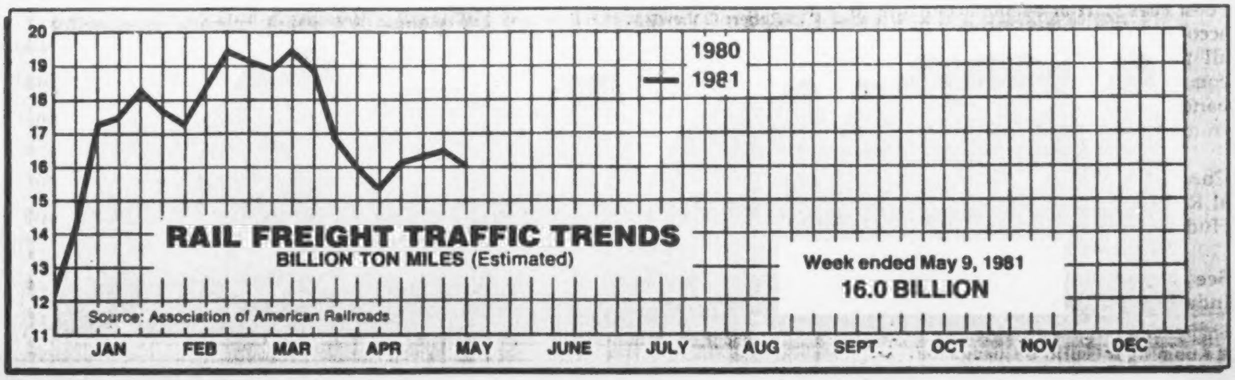
CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Apr. 21 totaled 4.7 million tons (down 12.1% from 1980). Cars loaded totaled 68,055 (down 12.5% from 1980). Cumulative loadings for 1981 were up to 76.0 million tons (down 0.1% from 1980).

- *Amtrak.*—Awarded a $6-million contract to the Communications Switching Systems Division of Rockwell International for the supply of five Collins Automatic Call Distribution (ACD) systems. The Collins ACD's are expected to provide Amtrak with a call handling capacity sufficient to meet passenger reservations requirements over the next 10 years. Amtrak, which will handle around 25 million telephone calls this year, expects that figure to rise to 52 million by 1990. The contract calls for model GVS-150 call distributors to be installed at Los Angeles, Chicago, New York, and Jacksonville, Fla. A larger model GVS-300 will serve the reservations department at Philadelphia. When the new network becomes operational next fall, callers who dial Amtrak's toll-free numbers will be connected digitally to the first available agent. Response times are expected to be less than 20 seconds for 85% of all calls. The five ACD systems will connect with more than 850 agent positions and will also interconnect with one another so that overflow and diversion can balance traffic loads between reservations centers.

- *Niagara Frontier Transportation Authority.*—General Railway Signal is the apparent low bidder, at $11.2 million, for the supply of a train control system for Buffalo's light rail rapid transit system. The GRS proposal calls for installation of an Automatic Train Protection system consisting of coded track circuits, cab signaling, overspeed protection, brake assurance, and wayside signals. The GRS equipment includes a motorman's console for each car, showing the vehicle's current speed and the maximum allowable speed for that section of track. If the maximum is exceeded, the system signals the motorman, and if he fails to apply the brakes within a pre-set time, the brakes are applied automatically. On the surface, the cars will operate with a 28-mph speed limit; the subway limit will be 50 mph. The 6.4-mile, 14-stop system is part of an integrated rail/bus transit system for the Buffalo metropolitan area.

- *Metropolitan Atlanta Rapid Transit Authority.*—Awarded a $5,750,000 contract to Cubic Western Data for supply and installation of automatic fare collection equipment at stations now under construction. Under an earlier contract, Cubic supplied AFC equipment for 11.8 miles of MARTA's rapid transit system now in operation. Turnstiles at each boarding and exiting station accept coins, tokens, and magnetically coded passes, and issue transfers. The new contract is to be completed by mid-1984.



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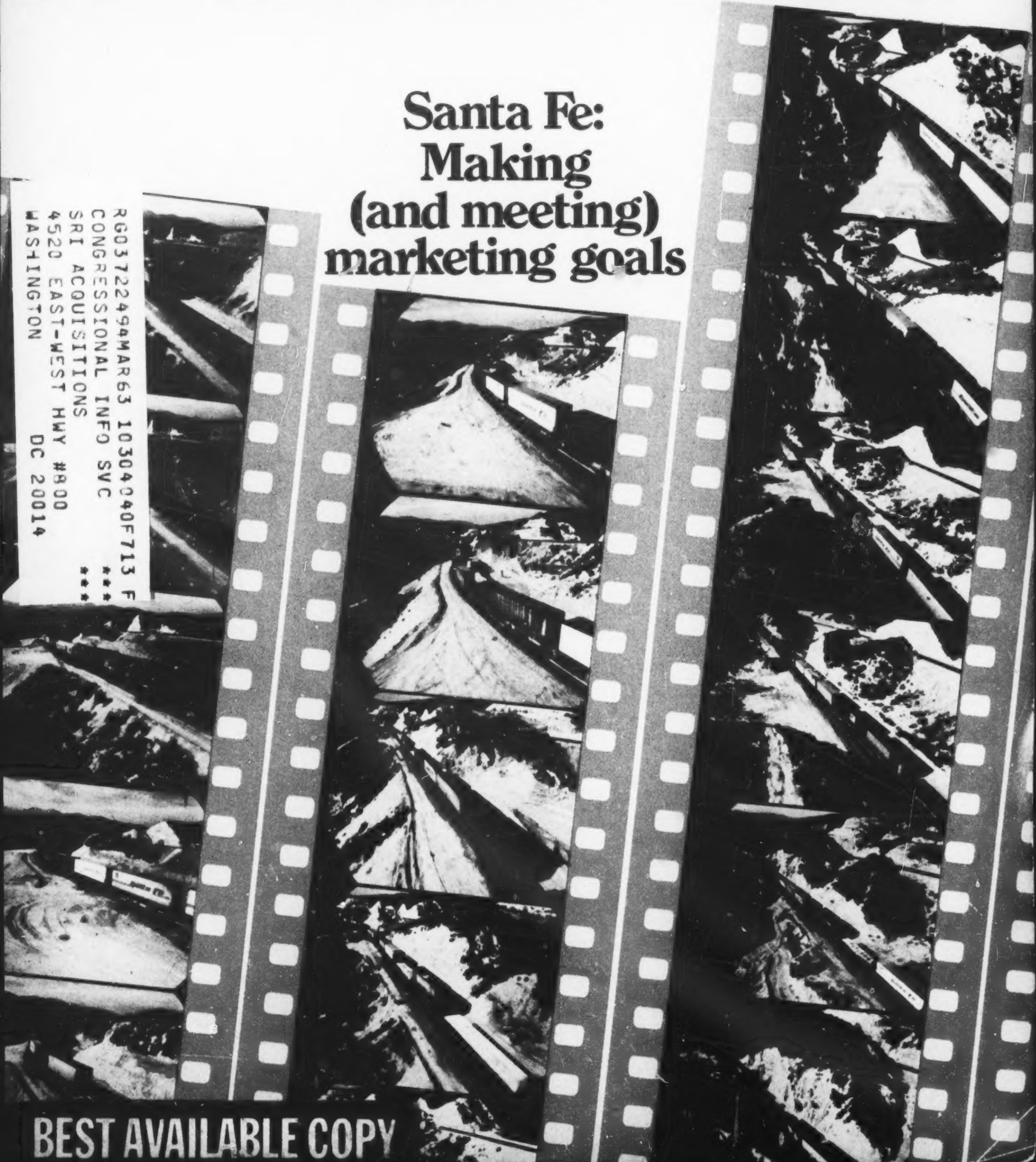
L&D prevention: New methods are paying off

June 29, 1981

RAILWAY AGE

Santa Fe: Making (and meeting) marketing goals



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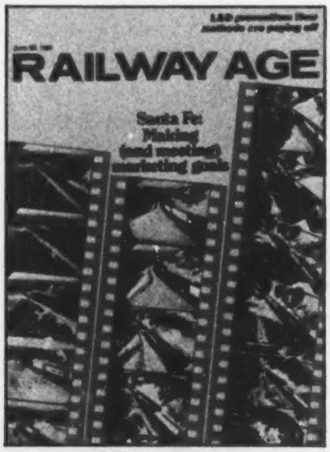
RAILWAY AGE
June 29, 1981

FEATURES



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26 Santa Fe: Making (and meeting) marketing goals

Goal-setting is no idle exercise on this railroad. It involves detailed planning that begins in the boardroom and spreads far afield before it becomes final. As a result, traffic forecasts tend to be close on target.

32 L&D prevention: Something to cheer about

The 1980 figures are now out—and they look good. The ratio of payout-to-revenues, 1.08%, was the best in 30 years. More good news may be on the way as L&D prevention specialists continue to refine the tools of their trade.

34 BACKPACKER: Youngstown's intermodal entry

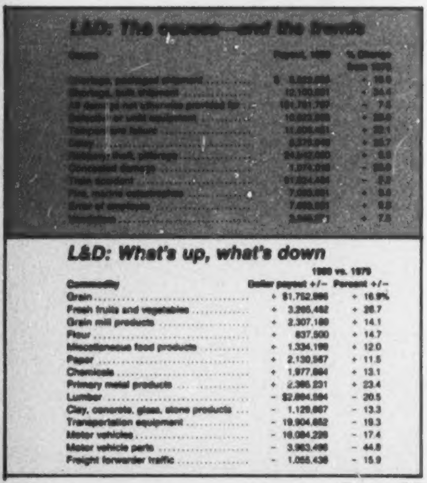
A car that can go anywhere, in unlimited interchange, is YSD's goal, and BACKPACKER appears to be just that. Now in prototype form, it involves well-type construction and maximum use of time-tested components.

38 Getting the government out of the railroad business

In an exclusive interview, FRA Administrator Robert W. Blanchette defends DOT's policies on Conrail and Amtrak, and talks about other efforts that will be made to de-emphasize government involvement in railroading.

44 Railview: Trailer Train's next 25 years.

"Trailer Train's first quarter century," says its president, Curtis D. Buford, "has laid an excellent foundation for its second quarter-century. But we move out into unsignalled territory...."



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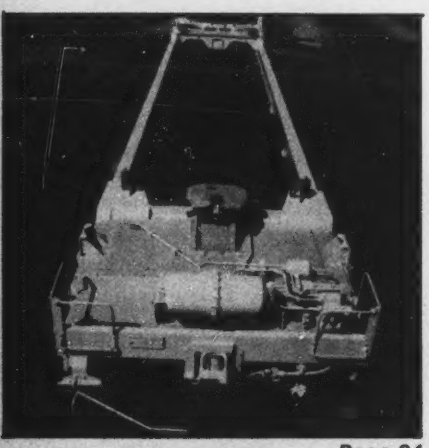

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Cover: Ten-Pack trains like this one play a big role in one of Santa Fe's marketing success stories—intermodal traffic.

Conrail: Both sides retreat

Conrail is going to be sold. It will be divested of commuter trains, relieved of certain labor obligations, provided with up to $375 million in additional aid, and then moved into the private sector.

That is the gist of compromise legislation taking shape in Congress. Democrats and Republicans alike have retreated from hard-line positions that had been hotly contested since the release of various recommendations on Conrail April 1 (*RA*, April 13, p. 59).

No longer are Republicans insisting on a quick sale that many feared would result in serious disruptions of service and the cherry-picking of choice Conrail lines. Democrats, meanwhile, have significantly reduced proposed funding levels and conceded the Administration's demand that a date—or dates—be set for the railroad's sale, either as a corporate entity or in pieces.

But while the essential elements of compromise were contained in three separate Senate and House bills, there remained, in mid-June, some important differences to be ironed out. Labor found the Senate compromise bill unacceptable. And the Reagan Administration found that one of two House bills would unduly prolong the life of Conrail as a ward of the state and said it would invite a White House veto.

Beginning June 1, 1982, proposed Senate legislation would allow the Secretary of Transportation to offer the railroad for sale in one piece. If six months later the sale had not been arranged and Conrail was judged by the United States Railway Association to be still unprofitable, the DOT secretary could offer individual lines to bidders. But if USRA judged Conrail to be profitable on Dec. 1, 1982, the railroad would have to be offered as a unit until Aug. 1, 1983. After that date it could be sold whole or piecemeal.

In the House, key Democrats and Republicans agreed on a slightly different alternative to the Administration's original breakup plan. The House bill was authored by Representatives Norman Lent and Gary Lee, both New York Republicans, and backed by Representative James Florio, the influential New Jersey Democrat who heads the Surface Transportation Subcommittee. They were chiefly concerned that not enough time was provided in the Senate legislation for Conrail to benefit from the elimination of commuter and labor burdens.

Thus a schedule longer than that in the Senate's bill was specified. Conrail would be preserved until at least the end of 1983. Only if the railroad missed goals set for review at the time of semi-annual payments by USRA would the breakup of Conrail be allowed. It is this bill that the Administration opposes.

Another bill, offered by Representative James Broyhill (R.-N.C.), would permit the sale to take place about one year earlier than the Lent-Lee bill. It would provide only $275 million in interim funding, versus $375 million in the Lent-Lee package.

Title V employee protection will be replaced, under both House and Senate legislation, by lump-sum payments not to exceed $25,000 per terminated employee.

One vital point that has been tackled by the legislators is the question of how to define profitability. A Senate Democratic staff member said that use of the ICC's formula seemed unfair since even many "successful" roads don't do very well under that criterion. Instead, profitability has been defined as Conrail's ability to generate a positive net income on its revenues, with certain exceptions. Excluded from this determination would be payments for labor protection and some obligations to the government. The staff member explained, "We wanted a definition that we thought Conrail could reasonably meet."

Earnings soar in first quarter

Revenues continued to rise faster than expenses in this year's first three months, with the result that Class I railroads were able to report one of their most profitable first quarters in recent memory. They posted ordinary (net) income totaling $636.4 million, compared with $263.0 million in the corresponding 1980 quarter. Operating revenues rose to $7.7 billion in the 1981 period from $6.7 billion a year ago. Operating expenses rose to $7.0 billion from $6.3 billion in 1980.

Even the trouble-plagued Eastern District railroads were able to report a profit of $66.8 million in this year's first quarter, compared with a deficit of $2.9 million last year. Western railroads earned ordinary income of $419.4 million, up from $162.8 million. Southern roads reported income of $150.2 million, up from $103.1 million last year.

The rate of return on net investment for the 12 months ended March 31 was 4.92%, up from 3.41% a year ago.

CLASS I RAILROADS IN THE UNITED STATES
For the First Quarter

	1981 (millions)	1980 (millions)
Operating Revenues	$ 7,659.6	$ 6,673.3
Operating Expenses	6,960.3	6,289.4
Income Taxes on Ordinary Income	125.3	59.1
Provision for Deferred Taxes	112.2	72.2
Net Railway Operating Income		
United States	468.9	258.4
Eastern District	43.1	Def. 13.5
Southern District	142.2	109.1
Western District	283.6	162.8
Rate of Return on Net Investment[1]		
United States	4.92%	3.41%
Ordinary Income[2]		
United States	636.4	263.0
Eastern District	66.8	Def. 2.9
Southern District	150.2	103.1
Western District	419.4	162.8

[1] For 12 months ended March 31 (preliminary)

[2] Income before extraordinary items

Def.—Deficit

Something to cheer about

Among railroad freight-loss-and-damage-prevention specialists, morale these days ought to be pretty high. Why?

—Despite inflation, freight-claim payout last year actually went down. For U.S. roads alone, payout in 1979 was more than $287.1 million. In 1980, it was $284.5 million. For U.S., Canadian and Mexican roads combined, payout dropped from $328 million to $324.5 million.

—The ratio of payout-to-revenues, regarded by prevention experts as the key number, dropped sharply, from 1.22% in '79 to 1.08% in '80. That was the lowest ratio recorded in 30 years and continued the trend that took shape during the past decade after the ratio peaked at 1.97% in 1970.

—The number of new claims filed in 1980 totaled just 1,548,898. That was a drop of 26.7% from 1979 levels. It was the lowest new-claim number in 47 years.

—For the first time, the AAR's Freight Claim and Damage Prevention Division had supplier exhibits in conjunction with its annual meeting. With about a dozen and a half exhibitors, it wasn't a huge show. But it was a good blend of familiar names—Portec, Signode, Aeroquip, for example—and names that aren't exactly household words.

—Perhaps most important of all, for the long run, loss-and-damage-prevention people may be on their way to having a tool that will make it possible for them to do a far more precise job of determining what causes damage and what can be done to prevent it. The tool: A simulator, not unlike the one that's been installed at the DOT Test Center at Pueblo, Colo.

● **"Irrefutable testing."** What the L&D-prevention people have in mind is an electro-hydraulic rail-vehicle simulator that will rock, roll, shake and otherwise actuate a railcar to mimic over-the-road conditions. As the Damage Prevention Committee put it in its proposal, "used in a laboratory setting along with an adjacent impact test track, irrefutable testing will result. The simulator will successfully overcome the serious limitations of present damage-prevention testing, which is basically reduced to an origin-destination inspection process and pass/fail judgments based upon those inspections."

The simulator, the committee says, "will remove any question of test validity by allowing for repeatability and for duplication of the railroad environment."

In addition, operating costs could be reduced: "Test control will be regained through reducing time-consuming and costly field testing. For example, one 25-car field test under the present system accrued a conservative cost estimate of $14,050 in personnel wages and travel expenses. This same test could be expected to be conducted on the simulator at a cost of about $4,[illegible]20. The substantial reduction comes from the fewer number of tests required in order to reach a definitive conclusion, the fewer man-hours required and the lack of associated expenses. Deficiencies in load design, packaging and restraint systems will be observable throughout testing. Manpower productivity will increase and the expertise of our engineering staff will be far better utilized."

The simulator, the committee notes, "will also make possible a wide range of research in dynamics such as car stability, car suspension, carbody structural analysis and, to a lesser extent, fatigue and approval testing. Existing facilities are not capable of meeting all of these requirements."

So far as the Damage Prevention Committee is concerned, the simulator proposal "is one of the most exciting projects the DPC has had in some time. It contains the possibility of not only changing our approach but also of dramatically improving our results. This will have a direct benefit for the carriers in terms of reduced payments. Perhaps more important, it will benefit our customers through reduced damages and thus make the railroads more competitive with other forms of transportation. This alone would probably justify the acquisition of such a device."

Where does the proposal stand? It's been approved by the Management Committee of the FC&LDP Division and sent up to the vice president-Operations and Maintenance Department of the AAR; at the same time, an alternative is being looked at, one which would involve modification of the DOT Pueblo simulator to make it suitable for L&D-prevention test work.

● **Approaching the magic 1%.** Putting a simulator to work, however, may be the big story to come from next year's meeting of the Division. This year, those 1980 numbers had to get the spotlight, as the railroad industry—just 10 years after flirting with a 2% ratio and a payout of almost $2 for every $100 of freight revenue—came within a whisker of the magic 1%.

Actually, a good number of carriers, large and small, are already under 1%. Among major roads, that list for 1980 includes Canadian Pacific, Santa Fe, Florida East Coast, Seaboard Coast Line, Kansas City Southern, Southern, Norfolk & Western, Burlington Northern, Soo Line, Rio Grande and the railroad that checked in with the lowest number among the majors, the Chesapeake & Ohio part of Chessie, at 0.583%.

There are, of course, some major coal-haulers in that elite group, and coal isn't all that susceptible to damage or even loss. But as Burlington Northern points out, if you take its 1980 ratio of 0.626% and then factor out the coal traffic, it still comes in at a very respectable 0.85%. And, BN President Richard C. Grayson notes, BN is a good example of what can be done if the effort is made: In 1971, the first full year of post-merger BN operation, its ratio was 1.98%, a penny above the industry record-high set the year before. Dick Grayson translates ratios into dollars: "Had we maintained that dismal ratio, last year we would have paid out $50 million in claims. As it was, we paid out $18.2 million. Naturally, we'd like to have seen that $18.2 million added to our bottom line. But paying $18.2 million is considerably better than paying $50 million. And we're improving each year."

Too, the L&D-prevention effort looks even better when inflation is taken into account. For instance, the statisticians have figured that if you apply 1979 and 1980 Producer Price Index numbers to the payout totals, you find that the decrease in payout was more than $43 million, or 13.1%, rather than the $3,496,230, or 1.1%, indicated when the totals are stated in actual dollars.

● **The traffic mix factor.** Before everybody decides to go out for a long lunch, however, there are a few numbers to consider.

For one thing, 1980 was a horrendous year for the automobile industry. Carloadings reflected that. Loadings of vehicles and equipment fell by 24%. L&D payout on vehicles dropped by only 17.4%, although payout on motor vehicle parts really went down, by 44.8%. Overall, payout on auto-industry-related claims declined by roughly $20 million, and the commodity-categories which had accounted for 30.9% of total payout in 1979 accounted for 25% last year. Payout, L&D-prevention people will acknowledge, is still far too high—but it's being worked on, and results are beginning to show up.

Then, there are other numbers related to traffic increases. Railroads last year did a good business in grain, coal and perishables. Payout due to shortage-bulk shipment went up by 34.4%, temperature-failure payout rose by 32.1% and claims

L&D: The causes—and the trends

Cause	Payout, 1980	% Change from 1979
Shortage, packaged shipment	$ 6,522,856	+ 18.9
Shortage, bulk shipment	12,100,831	+ 34.4
All damage not otherwise provided for	151,761,797	− 7.5
Defective or unfit equipment	10,623,965	+ 20.0
Temperature failure	11,806,451	+ 32.1
Delay	8,375,048	+ 20.7
Robbery, theft, pilferage	24,842,080	+ 5.5
Concealed damage	1,074,018	− 26.6
Train accident	81,824,484	− 5.2
Fire, marine catastrophes	7,083,961	+ 9.6
Error of employee	7,083,961	+ 9.6
Vandalism	3,246,271	+ 7.5

L&D: What's up, what's down

Commodity	1980 vs. 1979 Dollar payout +/−	1980 vs. 1979 Percent +/−
Grain	+ $1,752,996	+ 16.9%
Fresh fruits and vegetables	+ 3,265,482	+ 26.7
Grain mill products	+ 2,307,189	+ 14.1
Flour	+ 837,500	+ 14.7
Miscellaneous food products	+ 1,334,199	+ 12.0
Paper	+ 2,130,567	+ 11.5
Chemicals	+ 1,977,864	+ 13.1
Primary metal products	+ 2,395,231	+ 23.4
Lumber	− $2,694,584	− 20.5
Clay, concrete, glass, stone products	− 1,129,667	− 13.3
Transportation equipment	− 19,904,652	− 19.3
Motor vehicles	− 16,084,228	− 17.4
Motor vehicle parts	− 3,963,496	− 44.8
Freight forwarder traffic	− 1,055,438	− 15.9

related to the provision of defective or unfit equipment climbed by 20%. Even so, payout in these three categories added up to just about $35 million, considerably less than half of the payout on motor vehicles alone.

Next, look at year-to-year commodity comparisons. In the breakout, 40 specific commodity categories are listed for which 1980 payout was $1 million or more. In only nine of those categories did payout go down—soybeans, whiskey, tobacco products, plywood or veneer, flat glass, freight forwarder traffic, shipper association traffic and, of course, motor vehicles and motor vehicle parts.

In terms of L&D-cause categories, there were ups and there was downs.

Payout because of shortages in both packaged and bulk shipments was up, up by quite a bit on a percentage basis although together these two categories account for less than 6% of total payout.

The catch-all category, all damage not otherwise provided for, was down, with the reduction in claim-payout on motor vehicles accounting for more than the net decrease.

Payout because of defective or unfit equipment climbed by 20% from 1979 levels. Claims on grain traffic accounted for about half of the dollar increase.

Temperature failure? It was up, too, with claims on fresh fruits and vegetables and on frozen fruits and vegetables mostly responsible.

Then, there was the train-accident category. Reflecting improvements in track and equipment maintenance, payout was down by 5.2%, though it still represented 25.2% of total payout.

● **Theft and vandalism.** And finally, among major cause-categories, there were increases in the two "outside" causes—robbery-theft-pilferage and vandalism. Stealing pushed claim payout up by 5.5%, vandalism was up by 7.5%. Together, these two cause-categories have been on the rise and are getting closer to accounting for 10% of the total claim bill. And, even with motor-vehicle traffic down, vandalism to cars and trucks accounted for most of the payout increase in that category. As for stealing, maybe the results for '80 reflected the economy: Food and kindred products claim-payout went up by more than $860,000, with substantial increases in payout for miscellaneous food products, beer and seafoods.

Overall, most of the credit for the declines in payout and in ratio have to go to two things: The commodity-by-commodity approach to damage-prevention which has been taken and the improvement in plant and equipment which has helped to produce a 26% cut in the number of derailments over the past two years.

Currently, the Damage Prevention Committee has eight sub-groups working in specific areas—grain; food and kindred products; plywood, lumber and wood products; paper; clay, concrete and stone products; motor vehicles; primary metal products; and research and testing.

Of these, perhaps the most significant—in terms of the potential for reducing damage and payout—may be the effort devoted to movement of motor vehicles.

That effort started with an audit of origin ramps (*RA*, Nov. 24, 1980, p. 19) and was completed with about 50 origin points covered. The program, L&D-prevention people say, "was highly successful, in the eyes of both the railroads and the vehicle manufacturers. It not only evaluated and ranked individual ramps, but it also, on the positive side, resulted in corrective action. Those who were skeptical when the program began have, almost to a person, been converted. The origin program is now being followed by a destination-ramp audit program. These audits have a two-fold purpose—to evaluate the operation of the destination ramps and recommend improvements and to evaluate inbound loads as a means of following up on the origin audits."

Is the motor-vehicle program one that can be carried over into other commodity areas? AAR and the DPC think it is. Currently, a sub-committee is trying to apply some of the lessons learned on cars and trucks to the prepared-food-and-kindred-products area. This group is in the process of developing a prevention program which will include structured warehouse audits conducted cooperatively by the carrier involved in the traffic, the AAR staff and the customer. ■

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REVENUES AND EXPENSES OF RAILWAYS

Fourth quarter figures of calendar year 1980

(Dollar figures are stated in thousands: i.e., with last three digits omitted)

		Operating revenues				Operating expenses: Way & structures			Operating expenses: Equipment			Operating expenses		Operating ratio		Income after fixed charges		Net Ry. operating income	Net income	
		Freight	Other	Total 1980	Total 1979	Total 1980	Total 1979	Deprec.	Total 1980	Total 1979	Deprec.	Total 1980	Total 1979	1980	1979	1980	1979		1980	1979
Amtrak	3 mos.	–	295,427	295,427	276,762	24,046	16,040	895	84,650	71,210	14,493	299,995	243,142	101.54	87.84	(20,007)	19,087	(4,567)	(20,007)	19,087
	12 mos.	–	1,105,413	1,105,413	1,012,279	88,329	87,580	8,267	347,225	280,784	54,289	1,175,712	993,519	106.35	98.14	(108,528)	(20,911)	(70,296)	(108,528)	(20,911)
Atchison, Topeka & Santa Fe	3 mos.	579,501	12,914	592,415	522,555	80,786	81,110	3,410	116,996	112,577	20,456	499,100	470,917	84.2	90.1	95,607	51,151	68,928	70,966	43,068
	12 mos.	2,156,790	47,693	2,204,483	1,872,620	351,776	313,910	13,089	462,587	406,390	79,234	1,976,601	1,705,303	89.7	91.1	214,384	158,618	–	162,930	128,036
Baltimore & Ohio	3 mos.	247,166	7,484	254,650	243,333	40,826	37,624	1,728	52,642	56,312	8,365	228,365	219,139	89.7	90.1	21,068	25,649	–	14,972	22,375
	12 mos.	913,355	32,596	945,951	922,248	179,784	160,005	6,833	206,749	216,806	29,034	889,353	858,272	94.0	93.1	41,404	61,465	51,186	34,629	55,474
Bessemer & Lake Erie	3 mos.	23,440	3,150	26,590	31,737	2,642	4,063	686	2,304	6,898	1,079	17,468	24,170	65.69	76.15	10,267	8,994	5,299	6,444	3,412
	12 mos.	97,885	11,985	109,871	121,449	13,830	13,979	2,729	14,788	23,018	4,695	74,622	83,622	67.91	68.85	38,805	40,344	17,883	21,435	19,883
Boston & Maine	3 mos.	27,635	1,696	29,331	27,689	4,849	4,759	262	6,715	8,700	(86)	26,183	29,155	89.3	105.4	3,995	(1,562)	3,208	925	(4,235)
	12 mos.	107,564	7,472	115,036	108,310	21,156	20,152	1,065	28,707	31,819	1,481	111,404	110,862	96.8	102.4	6,123	(976)	3,868	(4,802)	18,187
Burlington Northern	3 mos.	804,812	27,085	831,897	588,077	161,069	137,901	5,543	178,337	147,704	16,913	757,125	652,467	91.01	94.82	89,739	45,161	49,862	64,804	49,779
	12 mos.	2,886,251	96,451	2,982,702	2,446,402	580,046	508,738	21,369	637,573	555,585	66,834	2,745,644	2,340,185	92.05	95.65	287,009	155,442	172,831	222,715	175,221
Chesapeake & Ohio	3 mos.	245,309	10,414	255,723	226,285	33,470	34,232	1,492	51,762	48,975	4,761	216,675	197,921	84.7	87.5	74,577	59,268	–	55,642	50,584
	12 mos.	904,078	44,929	949,007	812,635	158,631	137,009	5,896	193,275	183,896	15,292	830,420	748,294	87.5	92.1	179,055	135,080	71,355	131,620	116,567
Chicago & North Western	3 mos.	236,239	24,100	260,339	209,906	52,638	35,035	1,084	65,623	56,414	4,167	253,309	201,283	97.29	95.89	5,691	6,546	8,447	5,647	6,923
	12 mos.	844,636	91,099	935,736	747,442	193,708	150,634	3,936	239,691	213,514	16,934	922,174	766,363	98.55	102.53	(2,276)	(36,561)	17,348	(2,431)	(34,944)
Chicago, Milwaukee, St. Paul & Pac.	3 mos.	90,223	15,351	105,574	126,284	(107,856)	30,263	1,329	28,689	41,583	4,249	(15,636)	149,703	(14.8)	118.5	67,420	(21,781)	120,465	(34,566)	(21,781)
	12 mos.	336,553	53,405	389,957	455,446	91,379	105,437	3,285	134,191	172,507	18,642	488,995	574,361	125.4	126.1	(78,405)	(105,178)	(100,885)	(205,580)	(105,178)
Clinchfield	3 mos.	23,525	170	23,695	19,281	4,228	3,475	111	3,823	2,725	941	18,530	14,351	78.2	74.4	3,493	(235)	6,048	–	–
	12 mos.	88,747	1,118	89,866	66,207	15,413	13,586	432	13,665	12,126	3,708	65,856	54,067	73.3	81.7	12,218	(74)	–	–	–
Colorado & Southern	3 mos.	31,913	1,052	32,790	24,151	5,484	7,175	64	7,248	6,468	690	29,312	28,209	89.39	116.80	5,243	136	3,928	5,692	2,081
	12 mos.	123,295	2,881	126,176	87,681	28,063	25,700	242	28,748	21,578	2,821	121,457	96,274	96.26	109.80	19,039	6,682	6,841	21,161	10,869
Conrail	3 mos.	831,449	165,156	996,605	979,910	188,599	212,240	5,073	264,589	286,319	34,269	1,026,997	1,094,091	103.0	111.7	(45,030)	(129,949)	–	(45,383)	(130,296)
	12 mos.	3,153,584	648,006	3,801,342	3,770,466	771,483	857,418	20,224	1,060,022	1,105,146	138,762	4,152,532	4,251,386	109.2	112.8	(407,739)	(518,409)	348,656	(405,781)	(517,520)
Delaware & Hudson	3 mos.	24,785	1,726	26,512	26,478	6,452	5,312	155	6,721	8,509	720	28,848	28,855	108.8	101.3	(4,003)	(1,142)	–	(4,003)	(1,142)
	12 mos.	108,339	4,835	113,174	102,237	22,448	18,124	616	31,914	32,939	1,837	118,705	108,339	104.9	106.0	(9,226)	(8,666)	(5,440)	(9,226)	(8,666)
Denver & Rio Grande Western	3 mos.	77,936	1,126	79,063	67,732	12,235	11,452	617	11,462	10,282	2,914	63,461	56,742	80.26	83.77	14,177	9,889	12,217	10,758	7,677
	12 mos.	281,138	6,536	287,474	257,484	47,467	47,115	2,435	43,772	40,132	11,486	241,157	216,877	83.88	84.22	40,938	39,723	33,023	27,507	27,670
Detroit, Toledo & Ironton	3 mos.	19,855	653	20,508	20,822	3,340	3,129	186	4,981	6,464	472	20,167	20,511	98.3	98.5	57	150	352	(291)	158
	12 mos.	70,691	3,473	74,164	84,264	11,952	13,377	711	22,403	24,361	1,878	78,451	80,857	105.8	96.0	(4,932)	3,122	(4,022)	(5,062)	3,130
Duluth, Missabe & Iron Range	3 mos.	19,663	418	20,081	22,459	5,039	9,689	863	3,249	2,600	695	18,421	22,475	91.73	100.07	2,668	942	220	1,266	308
	12 mos.	89,105	3,714	92,819	96,809	24,302	28,172	3,580	9,627	11,111	2,756	73,732	79,556	79.43	82.17	22,704	19,527	8,234	11,793	9,498
Elgin, Joliet & Eastern	3 mos.	16,772	10,695	27,466	34,279	2,823	4,155	184	2,455	5,303	1,503	20,995	27,907	76.4	81.4	7,650	8,112	1,965	6,267	3,896
	12 mos.	67,627	42,305	109,931	145,843	13,536	16,132	730	14,083	23,423	5,388	93,795	112,909	85.3	77.4	23,579	38,395	4,493	15,061	19,987
Florida East Coast	3 mos.	27,798	628	28,426	22,989	7,012	5,362	244	4,514	3,641	1,115	24,893	17,885	87.5	77.8	7,687	13,612	666	4,822	9,683
	12 mos.	94,805	2,737	97,542	79,106	21,207	17,792	947	16,457	11,646	4,159	77,543	62,279	79.5	78.7	29,872	50,153	9,249	19,222	35,266
Ft. Worth & Denver	3 mos.	33,754	961	34,715	26,314	8,233	4,186	80	6,862	6,385	137	31,395	21,857	90.43	83.06	3,331	5,147	1,517	1,528	3,500
	12 mos.	133,256	3,779	137,035	93,227	24,469	13,702	295	32,211	22,066	533	117,625	76,153	85.83	81.68	19,728	18,064	11,996	12,314	14,138
Grand Trunk Western	3 mos.	50,103	3,331	53,434	53,569	7,068	5,219	419	9,968	11,642	1,414	50,591	51,123	94.7	95.4	2,183	3,100	4,169	3,505	–
	12 mos.	181,913	12,769	194,682	213,185	28,985	27,075	1,665	42,266	54,718	5,445	198,946	210,651	102.2	98.8	(5,213)	4,342	(7,144)	(966)	–

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Illinois Central Gulf	3 mos.	238,328	20,991	259,317	241,834	45,578	46,338	1,816	71,772	64,742	7,426	252,733	239,412	97.5	99.0	2,411	(4,073)	7,146	2,402	(3,788)
	12 mos.	891,388	81,878	973,266	853,296	185,990	168,731	6,897	269,295	241,295	29,135	983,099	883,146	101.0	103.5	(29,179)	(32,720)	(5,588)	(27,227)	(32,072)
Kansas City Southern	3 mos.	70,339	3,523	73,862	62,910	15,200	11,034	447	16,154	15,571	4,027	66,964	55,456	90.7	88.1	6,378	7,547	6,390	5,836	5,134
	12 mos.	260,995	16,163	277,158	221,415	53,306	41,632	2,231	63,834	52,596	14,291	244,320	197,120	88.2	89.0	30,999	23,488	25,563	23,587	17,806
Long Island	3 mos.	5,359	87,584	92,943	77,843	16,594	20,145	849	21,284	19,633	1,437	90,591	94,676	97.5	121.6	2,122	(15,777)	3,393	2,122	(15,777)
	12 mos.	20,260	333,442	353,703	301,386	72,647	74,178	3,396	79,701	73,040	5,429	367,545	338,791	103.9	112.5	(14,832)	(37,333)	–	(14,832)	(37,333)
Louisville & Nashville	3 mos.	272,563	6,477	279,040	266,897	46,431	43,293	1,883	62,009	65,462	9,901	257,484	250,637	92.3	93.9	14,396	17,941	27,661	19,270	15,712
	12 mos.	1,037,313	27,082	1,064,395	973,239	179,478	166,736	6,263	245,864	248,868	38,542	999,746	929,997	93.9	95.6	41,747	16,410	–	44,217	24,568
Missouri-Kansas-Texas	3 mos.	61,912	2,396	64,308	48,479	11,182	8,393	256	19,208	13,376	816	61,087	45,978	95.0	94.8	1,501	1,087	–	754	2,292
	12 mos.	210,552	10,365	220,917	166,087	36,528	30,728	958	65,239	47,117	2,943	210,521	163,189	95.3	98.3	3,598	(1,923)	10,601	3,351	4,467
Missouri Pacific	3 mos.	444,806	12,750	[illegible]	382,525	73,636	46,320	2,458	107,188	86,562	16,221	402,553	326,472	87.97	85.34	49,731	48,119	41,317	33,574	37,059
	12 mos.	1,639,857	50,636	1,690,498	1,418,727	253,395	211,503	9,758	385,586	325,169	61,887	1,479,904	1,234,979	87.54	87.04	179,725	152,976	163,987	123,388	110,027
Norfolk & Western	3 mos.	402,096	17,088	419,184	373,524	54,250	49,560	3,451	73,698	71,595	13,483	302,463	287,048	72.2	76.9	131,837	95,389	67,576	81,443	56,156
	12 mos.	1,504,475	55,059	1,559,534	1,430,894	245,073	213,351	13,361	284,902	261,433	53,415	1,214,913	1,124,510	77.9	78.6	382,817	328,589	199,089	232,416	197,610
Pittsburgh & Lake Erie	3 mos.	20,807	1,348	22,155	21,721	3,612	2,929	27	732	1,533	229	15,941	14,977	71.95	68.95	4,504	3,401	6,616	4,900	2,973
	12 mos.	78,410	5,327	83,536	78,956	13,436	11,353	90	6,070	6,129	1,502	64,150	58,095	76.79	73.57	8,076	15,490	18,711	7,368	11,260
St. Louis-San Francisco*	2 mos.	86,028	2,350	88,378	–	14,670	–	659	18,771	–	2,431	79,015	–	89.4	–	7,722	–	7,156	5,303	–
	12 mos.	453,871	13,783	467,654	–	76,923	–	3,396	103,889	–	12,992	420,765	–	90.0	–	36,179	–	37,606	25,602	–
St. Louis Southwestern	3 mos.	82,872	1,978	84,850	67,969	12,143	9,292	453	16,329	11,639	5,889	70,504	56,112	83.09	85.49	12,068	9,473	13,212	10,932	4,035
	12 mos.	298,663	5,196	303,859	261,102	48,407	40,313	1,525	53,870	42,367	24,306	266,356	218,195	87.65	83.56	30,901	44,121	31,539	24,933	36,777
Seaboard Coast Line	3 mos.	310,308	9,952	32[illegible]	290,839	50,255	44,735	2,288	78,412	66,834	9,177	297,113	259,814	92.8	89.3	48,327	50,320	24,756	49,850	44,980
	12 mos.	1,179,678	40,452	1,220,13[illegible]	1,049,747	195,874	175,837	8,919	287,047	246,790	35,535	1,111,386	952,484	91.1	90.7	182,220	129,977	–	175,369	128,069
Soo Line	3 mos.	81,685	2,018	83,702	86,779	17,569	13,610	556	15,207	15,199	1,767	68,349	67,165	81.7	77.4	15,428	19,477	10,091	10,041	12,019
	12 mos.	307,362	6,903	314,265	290,511	64,396	53,472	1,522	58,958	59,527	7,834	264,004	246,266	84.0	84.8	50,214	44,305	35,123	34,045	27,568
Southern	3 mos.	419,697	9,912	429,608	396,243	77,076	73,492	4,602	76,718	75,689	18,670	654,248	337,426	82.45	85.15	63,870	47,623	56,927	14,130	33,315
	12 mos.	1,597,451	40,261	1,637,712	1,467,270	282,032	269,072	18,849	294,805	271,477	72,527	1,345,526	1,208,917	82.15	82.39	263,896	223,117	214,312	180,918	160,622
Southern Pacific	3 mos.	516,047	15,538	531,585	500,817	71,952	64,300	4,902	128,783	135,899	21,958	506,013	494,383	95.18	96.71	41,455	17,578	45,028	60,669	8,941
	12 mos.	1,987,224	62,825	2,050,049	1,930,524	268,533	277,635	19,393	523,425	527,501	83,559	2,003,045	1,882,134	97.70	97.49	54,957	69,231	65,967	72,812	56,514
Union Pacific	3 mos.	526,562	7,872	534,434	473,771	87,645	68,019	2,881	105,021	88,546	24,488	464,083	401,044	86.8	84.6	58,585	60,855	–	40,666	45,888
	12 mos.	1,971,424	31,328	2,003,052	1,742,294	316,163	261,458	11,062	385,847	320,945	94,216	1,731,709	1,495,237	86.5	85.8	222,283	205,327	214,351	104,738	149,142
Western Maryland	3 mos.	23,044	1,129	24,173	21,800	5,768	3,219	165	4,714	1,316	1,818	24,089	14,146	99.7	64.9	(934)	7,446	–	307	4,886
	12 mos.	88,753	4,000	92,752	78,412	21,694	13,147	652	14,042	7,371	5,860	84,308	57,908	90.9	73.9	8,358	20,522	6,653	6,536	13,656
Western Pacific	3 mos.	48,208	620	48,828	43,730	6,602	5,956	87	10,770	9,276	1,610	46,705	41,844	95.7	95.7	3,402	2,791	1,608	2,876	2,480
	12 mos.	182,422	2,593	185,013	–	24,472	–	350	42,565	–	6,643	181,094	–	97.9	–	7,066	–	2,870	5,858	–

*Now Springfield Region, Burlington Northern

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Ronald M. Giallonardo,
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Market

CARLOADINGS

Loadings of revenue freight in the week ended May 30 totaled 361,900 cars, according to the Association of American Railroads. This was a decrease of 29, 984 cars, or 7.7%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended May 30 are estimated at 15.3 billion, a decrease of 3.1% below the corresponding week of 1980. Both weeks included the Memorial Day Holiday. The decline was primarily attributable to the impact of the United Mine Workers' strike.

REVENUE FREIGHT CARLOADINGS

Commodity	May 30 week	May 23 week	May 16 week
Grain	19,853	20,886	21,081
Farm products	4,565	4,937	4,818
Metallic ores	38,855	38,528	35,668
Coal	62,083	64,642	62,534
Crushed stone, gravel & sand	12,697	14,149	14,131
Nonmetallic minerals	12,869	13,759	14,440
Grain mill products	12,555	14,100	14,343
Food and Kindred products	14,442	17,308	16,292
Primary forest products	16,891	19,216	20,006
Lumber and wood products (except furniture)	7,739	9,192	8,402
Pulp, paper and allied products	19,699	20,063	19,617
Chemicals and allied products	24,072	28,408	28,186
Petroleum products	4,642	5,419	5,364
Stone, clay & glass products	13,271	14,711	14,849
Coke	7,078	7,557	6,973
Metals and products	16,239	17,969	16,836
Motor vehicles & equipment	17,314	20,164	20,722
Waste & scrap materials	11,711	13,923	13,694
Forwarder & shipper assn. traffic	8,322	10,064	9,817
All other carloads	36,831	42,127	40,582
LCL traffic	172	205	235
Total Cars Loaded	**361,900**	**397,327**	**388,590**
Cumulative total,		1981	1980
22 weeks		**9,077,558**	**9,638,387**
Estimated revenue ton-miles (billions), 22 weeks		**380.2**	**388.1**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended May 23 totaled 34,319 cars (8.3% above the corresponding 1980 week) and 61,247 trailers or containers (up 6.1% from 1980). Cumulative volume for the first 21 weeks of 1981 is 675,430 (down 2.8% from 1980) and 1,226,863 trailers or containers (down 2.7% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended May 21 totaled 4.5 million tons (down 10.4% from 1980). Cars loaded totaled 65,109 (down 7.8% from 1980). Cumulative loadings for 1981 were up to 98.3 million tons (down 1.2% from 1980).

- *Massachusetts Bay Transportation Authority.*—Awarded a $6.2-million contract to Morrison-Knudsen's Railroad Division for rebuilding and conversion of 26 RDC cars to push/pull coaches, with option for 6 more RDC-3A and B cars.

- *New York City Transit Authority.*—Has extended by one month the deadline for receipt of bids on the supply of 225 to 325 R-62 rapid transit cars. Bids were originally due by 10 a.m. on June 30; the one-month extension was granted at the request of the Budd Co.

- *Washington Metropolitan Area Transit Authority.*—Awarded a contract totaling nearly $5 million to Cubic Western Data for modification of the system's automatic fare collection system. Cubic said it would incorporate its "product improvement package" into 309 two-way gates, 75 that allow entry only, and 75 that allow exit only. Cubic says it spent two years at its own expense to design and develop the improvement, "which guarantees WMATA a significant reliability enhancement on all equipment." Six gates At WMATA's Farragut West station served as test sites for the modification; they accommodate nearly 30,000 passengers a day and have achieved a reliability close to 100%, according to Cubic.

- *Freight cars and locomotives.*—The following report has been received from the AAR and the ARCI.

DELIVERED

	April 1981	April 1980	March 1981	Four months 1981	Four months 1980
Built new by carbuilders	3,792	7,546	4,718	17,975	30,555
Built new in RR shops	453	347	444	1,477	1,809
Built new—total	4,245	7,893	5,162	19,452	32,364
Rebuilt	125	181	136	446	607
TOTAL DELIVERED	**4,370**	**8,074**	**5,298**	**19,898**	**32,971**
Locomotives (new and rebuilt)	70	149	92	258	688

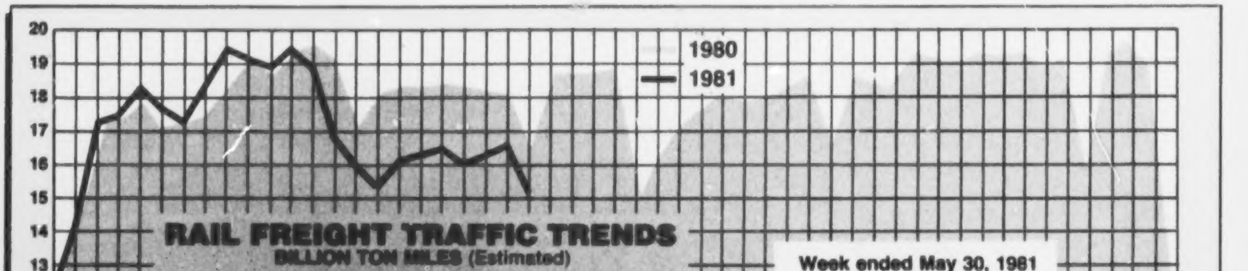
ORDERED

	April 1981	April 1980	March 1981	Four months 1981	Four months 1980
To be built new by carbuilders	1,737	2,851	1,559	8,202	15,908
To be built new in RR shops	25	1,015	0	25	1,015
To be built new—total	1,762	3,866	1,559	8,227	16,923
To be rebuilt	0	36	300	600	869
TOTAL ORDERED	**1,762**	**3,902**	**1,859**	**8,827**	**17,792**

ON ORDER AND UNDELIVERED

	May 1 1981	May 1 1980	April 1 1981	Average backlog 1981	Average backlog 1980
To be built new by carbuilders	35,920	84,847	38,059	39,849	98,708
To be built new in RR shops	3,052	5,458	3,480	3,672	5,358
To be built new—total	38,972	90,305	41,539	43,521	104,066
To be rebuilt	154	362	279	203	572
TOTAL ON ORDER	**39,126***	**90,667**	**41,818**	**43,724**	**104,638**
Locomotives (new and rebuilt)	341	1,083	411	437	1,194

*Due to revisions and cancellations of some orders, the May 1, 1981 backlog has been reduced by 84 cars.



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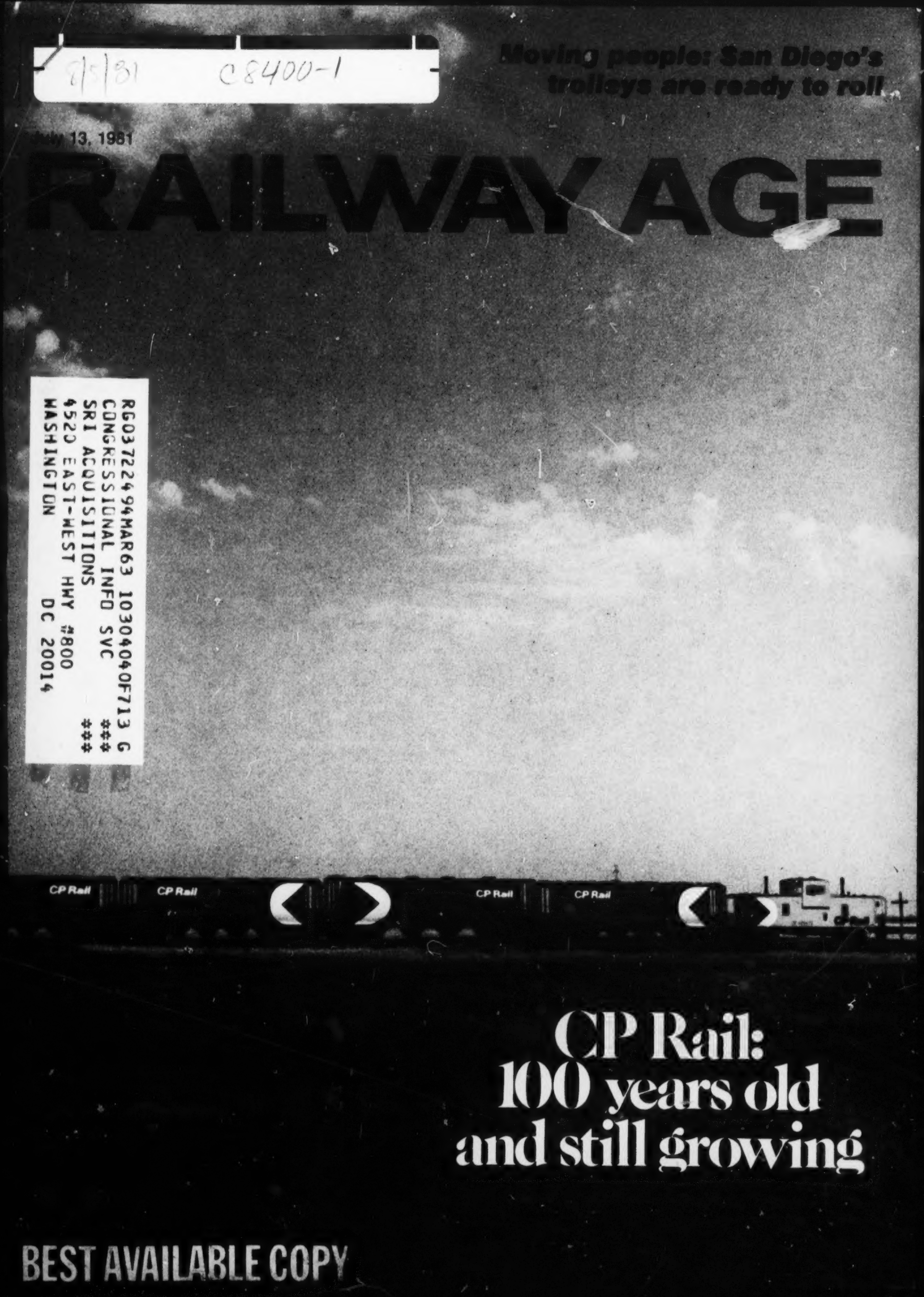
Moving people: San Diego's trolleys are ready to roll

July 13, 1981

RAILWAY AGE



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CP Rail: 100 years old and still growing

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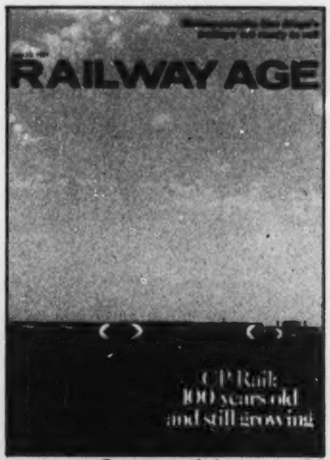
RAILWAY AGE

July 13, 1981

FEATURES



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18 Midyear Report: Unfinished business in Washington
Conrail and Amtrak have been grabbing the headlines, but many other issues are vying for attention in Washington. Meanwhile, the railroad industry as a whole is thriving; the railroad supply industry, unfortunately, isn't.

22 CP Rail: 100 years old and still growing
Canadian Pacific's railroad, which earned an 8.7% return in 1980, is now looking, in its centennial year, at greater accomplishments—a traffic increase of more than 60% through the decade of the 1980's.

34 ICG centralizes car management
One department is now responsible for "all decisions relating to the buying, building, leasing and repairing of freight cars, and for achieving the most efficient distribution and disposition of all...equipment."

36 KCPL teardown: Bigger, busier
Keeping close tabs on coal-car maintenance costs is the objective of the annual Kansas City Power & Light event. This year four cars went through the teardown exercise, and attendance was double that of any previous year.

40 DOE/JPL study: Coal is the way to go
Cal Tech's Jet Propulsion Laboratory, studying "Future Propulsion Systems for Railroad Locomotives" for the Department of Energy, has concluded that the coal-fired locomotive has most of the answers.

42 San Diego's trolleys are ready to roll
On July 26, 14 German-built light-rail vehicles (Siemens-DuWag) will start hauling revenue passengers on the nation's newest rail transit system. Nearly all of the funding is from state and local sources.

46 Cleveland upgrades catenary
The new system for the Shaker Heights rapid transit line is designed to be both esthetically pleasing and technologically sound.

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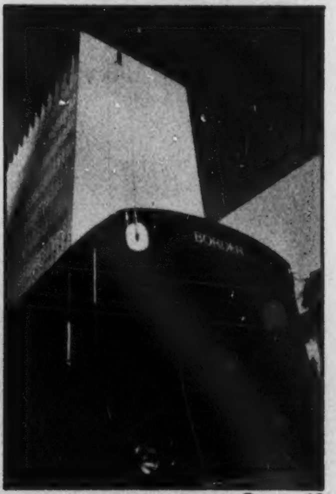
NEWS

10 **Shippers Committee contests OT-5**
12 **Conrail moves on two fronts**
12 **ICC approves IT sale to NW**
14 **Congestion eases at border**



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COVER: Trainload of CP Rail covered hoppers in potash service on the Canadian prairie.

Midyear report:

Unfinished business in Washington

By BILL FAHRENWALD,
Associate Editor

In Washington, a long agenda of unfinished business dogs the railroads at 1981's mid-point. Most of the issues that awaited action in January have seen movement, though some problems—like those of Conrail and Amtrak—have received more attention than others.

At least a dozen major questions vie for attention on Capitol Hill or before the ICC. With a new administration trying to change the shape of the federal government, it's not surprising that railroads are struggling just to be heard; prevailing, of course, is another matter.

This year's featured media performer has been Conrail, though Amtrak attracted considerable attention as it waged—and won—a fight for its existence as a national system. In the Northeast, the two issues are joined by the Corridor trackage and disputes arising over its use.

Legislation now before Congress would relieve CR of its commuter services and give them to Amtrak. Not all parties are yet in agreement on just how this should be accomplished and, in fact, not all commuter agencies are enamored with the idea of being uncoupled from Conrail only to be adopted by Amtrak.

Local and state authorities may be given the option of operating their own services, though this could raise problems with labor. Testifying before the Senate Surface Transportation subcommittee New Jersey Commissioner of Transportation Louis J. Gambaccini asked that commuter agencies be exempted from the Railway Labor Act. "Since most of a commuter agency's service is local," he said, "and since it is financed almost entirely by state and local funds, there seems to be little justification for not permitting the application of state labor laws in such instances."

Pending legislation also attempts to settle the long-running NEC cost dispute involving Amtrak, Conrail, and the commuter agencies. Essentially, the ICC would be directed to determine a fair price for Corridor use—and past debts would simply be forgiven.

Conrail is headed for a final resolution through government sale sometime between June 1, 1982 and the end of 1983, depending on what comes out of a House/Senate Conference Committee.

The House version would grant Conrail an additional $375 million and at least another 18 months to achieve profitability. Under the Senate bill, Conrail could be sold in one piece as early as June 1982; only $150 million in federal funding would be provided to help the railroad back to solvency. The Senate bill also includes a provision to allow Delaware & Hudson additional Conrail trackage rights, though no money is provided for D&H.

Transportation Secretary Drew Lewis predicted the U.S. taxpayers will have invested as much as $8 billion in the carrier when it is sold. But Lewis feels CR should be offered at a "discount" price of $1 billion or $2 billion. Better that, he says, than sell the railroad to its employees at a higher price, because "we feel that whoever buys CR [must have] the resources to support it. We'd much rather discount the price to make it attractive to a viable concern."

● **Back from the brink.** For Amtrak things looked very bleak as 1981 dawned. The Administration was talking tough about cutting back drastically on subsidies for a system that operated what Lewis called "empty trains." A ground swell of protest from around the nation and adroit maneuvering by Amtrak President Alan S. Boyd saved the day for Amtrak, though cutbacks of 15% from present service will still be necessary under the $735 million FY 1982 budget that is headed for approval.

Amtrak has reason to be concerned about two other projects that bear directly on its future. The Administration aims to carve $310 million from the Northeast Corridor Improvement Project (NECIP) by reducing the signal replacement program to a repair program and through plans to eliminate the new electrification project.

For service outside NEC, plans are also shaky. The Emerging Corridors report is receiving only a lukewarm reception, perhaps a result of the strain many congressmen are experiencing to keep up with the plethora of other rail issues they face.

If current House legislation is passed, Amtrak will be directed to prepare a plan to develop the most promising corridors. The report, due Jan. 15, 1982, would establish a timetable for starting or improving service on the corridors by late 1985. The study is also to contain plans for cutting Amtrak's costs by $100 million annually, including recommendations for reducing, discontinuing, and restructuring routes presently served.

The railroads

For railroads, 1981 is shaping up as an uncommonly good year, financially speaking. For railroad equipment suppliers, the picture is less rosy.

The reason for this is that the railroads' current prosperity, such as it is, is coming not from increased traffic, but from higher rates and tighter cost controls. Right now the carriers have more than enough equipment to handle the available freight, due to the extraordinarily heavy purchases of the last two or three years. Around 125,000 freight cars are idle; it's estimated that up to 2,500 locomotives are in storage.

● **Loadings down, profits up.** Despite the fact that carloadings were down more than 2% in this year's first quarter, and ton-miles were up only fractionally, the railroads were able to report net income of $636 million, compared with $263 million in first quarter 1980. Accounting for this were two principal factors: (1) the industry's ability to scale operating costs down to demand (employment is running about 6% lower than a year ago); and (2) a series of "timely" rate hikes that have let them recover increases in their overall costs at a far faster pace than in previous years. (Increases are coming on an even timelier basis now that the new quarterly cost index mechanism has gone into effect. The index is based on projected—not past—labor, material, and fuel costs. For example, a 2.8% increase that went into effect July 1 was based on anticipated costs as of Aug. 15—a far cry from the recent past, when railroads complained that the time lag between cost increases and compensating rate increases was costing them $500 million to $1 billion a year.)

But rate increases and cost controls do not respond to the railroad industry's basic need, which is more freight. In this respect, 1981 has been at best flat.

The first quarter's greatest strength was in coal loadings, which rose nearly 14% as users built up stockpiles in anticipation of the United Mine Workers strike. That strike lasted longer than anyone expected, and by June 20 coal traffic for the year to date was down 13.6%.

One bright spot in the current traffic picture, and a long overdue one, is provided by motor-vehicle traffic. Loadings in the first quarter were down 14.7% from 1980; but by June 20 that deficit had been wiped out.

Also on the comeback trail is piggyback. In six recent consecutive weeks, TOFC/COFC loadings were ahead of year-ago levels.

For calendar 1981, the AAR ex-

prosper; their suppliers don't

CARLOADINGS: 1981 vs 1980

Commodity	Jan. 1 to June 20 1981	% change from 1980
Grain	675,345	− 4.6%
Farm products ex. grain	103,074	− 3.3%
Metallic ores	749,497	+ 4.3%
Coal	2,355,333	−13.6%
Crushed stone, gravel & sand	308,486	−10.4%
Nonmetallic minerals	339,804	− 6.4%
Grain mill products	374,328	−13.3%
Food & kindred products	403,554	−11.3%
Primary forest products	475,517	− 3.9%
Lumber & wood prod. ex. furniture	217,930	− 7.1%
Pulp, paper & allied products	503,404	− 5.0%
Chemicals & allied products	700,190	0.0%
Petroleum products	133,807	−11.6%
Stone, clay & glass products	354,074	− 7.9%
Coke	163,239	+ 7.5%
Metals & products ex. coke	422,343	− 2.8%
Motor vehicles & equipment	440,968	+ 0.9%
Waste & scrap materials	322,696	− 0.5%
Forwarder & shipper assn. traffic	255,092	− 6.9%
All other carloads	1,011,673	− 4.4%
LCL traffic (cars)	6,245	+12.9%
Total cars loaded	**10,316,599**	**− 6.5%**

pects carloadings to come in about 1% below 1980, although ton-miles will be up around 3% due to heavier loads and longer hauls.

- **For carbuilders, a dry spell.** If the railroads are holding their own (or better) in this sluggish business year, as much cannot be said for some of their big suppliers, especially the carbuilders and their component manufacturers.

In this year's first five months 23,595 freight cars were delivered but only 9,418 cars were placed on order. The June 1 backlog was 35,588 cars. In the comparable period last year, 40,437 cars were delivered, 24,645 cars were placed on order, and the June 1, 1980, backlog was 87,451.

Some estimates now call for the delivery of around 50,000 new cars this year, and 22,000 new cars placed on order. When can a turnaround be expected? The best guess is around mid-1982. The carbuilders expect 1983 and 1984 to be strong years.

The builders see a long-term requirement of 68,000 cars a year, on the average. That could mean, of course, 100,000 cars one year and 36,000 the next—the kind of feast-or-famine business that drives builders up the wall and their costs off the charts.

- **"We're hurting badly."** Locomotive builders had been expecting a bad year—and it's turning out to be worse than expected. Current estimates are that fewer than 550 units (diesel-electric and electric) will be delivered to U.S. roads this year—and that's the lowest total since installations dipped to 488 new units in 1976.

Business, says Warren A. Fox, director-sales and service for General Motors' Electro-Motive Division, "is down considerably from what we had thought it would be. We're hurting badly, domestically, because of the economy."

If there is a bright spot for EMD, it lies in the numbers on market penetration—and, says Fox, those numbers show EMD delivering better than 70% of the new units to be put into service on U.S. roads in 1981. (Worldwide, he notes, EMD's share is slightly greater, at about 75%, including locomotives built here for service in North America, units built for export, and engine sets built in the U.S. for locomotive applications around the world.)

But Fox is not pessimestic for the long term. He sees little possibility for a pick-up in orders this year or in the early months of 1982, but he remains an optimist about the second half of '82 and succeeding years—his optimism based in large part upon the rail industry's being able to take advantage of deregulation freedoms and of basic fuel efficiencies. In the meantime, he says, EMD's top research-and-test priority continues to be further improvement in fuel efficiency.

A few roads are now testing EMD units to measure how much improvement has been made—and Fox is convinced that when those tests are completed later this year, EMD power will be shown to be as fuel-efficient as any that's available.

Meanwhile, the market for export locomotives is providing some cushion against the bad news at home. General Electric, for example, plans to ship at least 100 locomotives this year to Mexico, part of an order for up to 1,000 that GE nailed down with the National Railways of Mexico last year. At a recent briefing in Erie, where GE described its own fuel-efficiency gains (*R A* , April 27, p. 28) market forecasters were estimating that total U.S. locomotive production, domestic and export, would approach 900 this year (down from 1,600 last year) and that of these up to 300 would be for export.

Less badly off are suppliers in the maintenance of way field, where spending is being maintained at a fairly high level. An exception is Conrail, which has been slashing every possible expenditure under rising pressure from Washington. One supplier who built a plant primarily to serve Conrail reports that only 10% of his 1981 contracts have so far been honored.

Suppliers in the signaling and communications fields also report good business on the whole, although the Federal Railroad Administration's decision not to resignal Amtrak's Northeast Corridor lines will deprive two of the big signaling companies of big chunks of business.

While suppliers have seen better days, they have also seen worse days. As one of them recently put it: "Those of us who have made a long term commitment to the railroads, and are in this for the long haul, are going to do all right in the long run. The railroads are clearly in a period of rebirth; we're going to share in that."

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A RAILWAY AGE SERVICE PAGE

REVENUES AND EXPENSES OF RAILWAYS

First quarter figures of calendar year 1981

(Dollar figures are stated in thousands: i.e., with last three digits omitted)

		Operating revenues				Operating expenses: Way & structures			Operating expenses: Equipment			Operating expenses		Operating ratio		Income after fixed charges		Net Ry. operating income	Net income	
		Freight	Other	Total 1981	Total 1980	Total 1981	Total 1980	Deprec.	Total 1981	Total 1980	Deprec.	Total 1981	Total 1980	1981	1980	1981	1980		1981	1980
Amtrak	3 mos.	–	274,221	274,221	256,477	21,922	16,492	938	80,941	81,737	15,290	5,276	265,311	111.32	103.44	(45,730)	(15,676)	(31,054)	(45,730)	(15,676)
Atchison, Topeka & Santa Fe	3 mos.	568	13	581	511,416	89	79,615	4	128	114,634	21	535	479,782	91.97	93.81	40	26,651	35	29	20,383
Baltimore & Ohio	3 mos.	243	8	252	232,134	37	32,404	2	58	57,941	7	234	216,901	93.11	93.43	16	11,876	13	12	8,469
Bessemer & Lake Erie	3 mos.	21	1	22	19,103	3	4,222	–	2	5	1	17	20,294	74.92	106.23	7	169	2	4	379
Boston & Maine	3 mos.	28,903	1,653	30,556	27,944	5,567	5,064	282	8,088	7,791	360	29,945	28,656	97.99	102.54	1,626	(128)	678	1,430	(2,727)
Burlington Northern	3 mos.	898	25	923	679,867	124	94,348	6	200	144,031	18	821	601,319	88.90	88.44	125	95,999	67	90	76,445
Chesapeake & Ohio	3 mos.	239	8	247	207,528	35	31,253	2	50	50,645	3	216	193,817	87.54	93.39	52	26,154	16	38	20,589
Chicago & North Western	3 mos.	237	23	260	214	45	37	1	62	55	4	245	210	94.48	98.15	10	2	16	10	2
Chicago, Milwaukee, St. Paul & Pac.	3 mos.	91	12	103	106,449	10	42,954	1	35	43,135	4	111	163,724	107.49	153.80	141	(38,486)	(8)	141	(40,845)
Clinchfield	3 mos.	27	–	27	19,406	4	3,487	–	4	3,011	–	19	14,905	72.38	76.80	–	–	8	–	–
Colorado & Southern	3 mos.	37	–	38	29,599	6	4,605	–	8	7,355	–	31	26,891	83.53	90.85	13	7,321	4	11	8,679
Conrail	3 mos.	841	171	1,012	965,935	158	147,319	5	278	280,004	36	1,061	1,044,844	104.84	108.16	(58)	(79,867)	(48)	(57)	(79,019)
Delaware & Hudson	3 mos.	27	–	28	28,672	5	4,294	–	9	8,814	–	32	29,404	112.51	102.55	(5)	(1,600)	(3)	(5)	(1,600)
Denver & Rio Grande Western	3 mos.	78,800	1,379	80,179	68,803	13,326	11,431	621	12,284	11,419	3,400	67,538	59,809	84.23	86.92	11,987	7,758	7,625	6,939	5,164
Detroit, Toledo & Ironton	3 mos.	21	–	22	20,566	3	2,360	–	6	5,864	1	21	19,558	93.25	95.09	–	883	2	–	883
Duluth, Missabe & Iron Range	3 mos.	15	–	15	15,620	6	6,224	–	3	(141)	–	19	15,182	126.89	97.20	(3)	1,440	(3)	(2)	907
Elgin, Joliet & Eastern	3 mos.	18,054	11,558	29,612	31,258	2,989	3,375	193	2,960	5,110	1,820	22,877	26,237	77.25	83.93	8,385	7,154	2,991	4,641	3,874
Florida East Coast	3 mos.	25	–	26	22,886	7	4,791	–	4	3,476	1	23	17,505	87.05	76.48	4	6,181	2	3	3,795
Ft. Worth & Denver	3 mos.	42	–	43	31,297	7	4,542	–	9	6,932	–	33	24,199	76.61	77.32	10	7,070	6	7	4,452
Grand Trunk Western	3 mos.	53	3	56	53,413	6	5,338	–	11	13,779	1	53	52,393	96.00	98.09	1	1,609	4	3	1,609
Illinois Central Gulf	3 mos.	256	20	276	248,680	46	37,287	2	74	65,027	7	266	235,598	96.26	94.73	10	6,400	8	7	5,455
Kansas City Southern	3 mos.	71	4	75	66,989	14	10,826	–	16	15,207	4	65	57,266	86.49	85.48	9	9,346	8	7	6,846
Long Island	3 mos.	5	82	88	84,426	20	17,604	–	22	19,410	1	100	89,353	114.72	105.83	(13)	(5,127)	(12)	(13)	(5,127)
Louisville & Nashville	3 mos.	305	6	311	263,757	47	41,306	2	70	67,038	10	282	253,649	90.82	96.16	23	6,554	27	20	6,084
Missouri-Kansas-Texas	3 mos.	66	4	69	49,860	10	6,340	–	21	15,009	–	63	47,037	90.49	94.33	4	1,244	7	5	1,744
Missouri Pacific	3 mos.	465	14	478	398,809	67	46,560	2	108	94,476	15	412	348,541	86.19	87.39	59	42,298	49	39,558	29,226
Norfolk & Western	3 mos.	431	14	445	367,142	58	48,120	3	75	73,072	14	326	296,365	73.17	80.72	136	78,080	64	79	48,383
Pittsburgh & Lake Erie	3 mos.	18	1	19	18,920	3	2,788	–	3	1,090	–	18	14,536	94.55	76.83	–	1,270	–	–	863
St. Louis Southwestern	3 mos.	89	2	91	68,056	15	8,986	–	15	9,227	6	80	56,564	87.55	83.11	10	10,039	8	7	7,494
Seaboard Coast Line	3 mos.	333	11	343	302,172	54	48,045	2	79	69,966	9	306	273,633	89.06	90.55	64	40,887	34	61	38,527
Soo Line	3 mos.	78	2	79	80,175	11	10,062	–	15	15,924	2	62	63,404	78.21	79.08	18	16,771	11	11	10,987
Southern	3 mos.	428	10	437	400,985	58	64,394	5	80	73,619	19	344	325,395	78.55	81.14	92	74,757	63	59	51,214
Southern Pacific	3 mos.	529	16	545	497,426	79	62,623	5	136	132,429	22	539	502,299	98.86	100.97	4	(9,449)	6	4	(6,687)
Union Pacific	3 mos.	527	8	535	477,482	70	77,535	3	99	92,769	25	440	417,875	82.22	87.51	82	47,967	66	53	35,423
Western Maryland	3 mos.	21	1	22	19,545	5	4,052	–	2	3,381	2	20	18,813	87.32	96.25	3	1,028	2	2	545

Market

CARLOADINGS

Loadings of revenue freight in the week ended June 20 totaled 437,422 cars, according to the Association of American Railroads. This was a decrease of 11,145 cars, or 2.5%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended June 20 are estimated at 18.0 million, a decrease of 0.3% below the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity	June 20 week	June 13 week	June 6 week
Grain	27,682	25,182	22,324
Farm products	4,086	4,489	4,650
Metallic ores	37,747	36,120	34,004
Coal	110,633	92,175	66,401
Crushed stone, gravel & sand	13,873	13,220	14,145
Nonmetallic minerals	13,202	14,641	14,852
Grain mill products	13,791	13,926	15,334
Food and kindred products	15,209	15,359	16,211
Primary forest products	18,786	18,437	19,150
Lumber & wood products (except furniture)	8,904	8,413	8,636
Pulp, paper & allied products	19,584	19,259	20,376
Chemicals & allied products	26,455	26,280	25,773
Petroleum products	4,855	5,010	5,171
Stone, clay & glass products	14,116	14,115	14,607
Coke	7,213	7,388	7,034
Metals & products	16,219	16,148	17,100
Motor vehicles & equipment	19,896	20,295	20,654
Waste & scrap materials	12,611	12,770	12,877
Forwarder & shipping assn. traffic	9,680	10,130	10,179
All other carloads	42,659	42,051	41,096
LCL traffic	221	221	242
Total cars loaded	**437,422**	**415,629**	**390,816**
Cumulative total,		**1981**	**1980**
25 weeks		**10,316,599**	**11,033,564**
Estimated revenue ton-miles (billions), 25 weeks		**431.8**	**442.4**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended June 13 totaled 34,009 cars (6.8% above the corresponding 1980 week) and 60,593 trailers or containers (up 3.1% from 1980). Cumulative volume for the first 24 weeks of 1981 is 773,803 cars (down 1.4% from 1980) and 1,402,003 trailers or containers (down 1.7% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the ten-day period ended May 31 totaled 6.6 million tons (down 21.0% from 1980). Cars loaded totaled 96,236 (down 18.2% from 1980). Cumulative loadings for 1981 were 104.8 million tons (down 2.8% from 1980).

- *Consolidation Coal Co.*—Has formed a joint venture and entered into a long-term sales agreement with Rheinische Braunkohlenwerke AG (Rheinbraun), one of West Germany's largest mining companies, for the development of up to five large underground coal mines in southwestern Pennsylvania. Consol Chairman and Chief Executive Officer R.E. Samples said the project, when fully developed, could produce 12.5 million tons of coal annually. The coal will move by rail to Baltimore for export. Consolidation Coal Sales Co. has acquired a terminal site at Baltimore which it plans to develop by 1983.

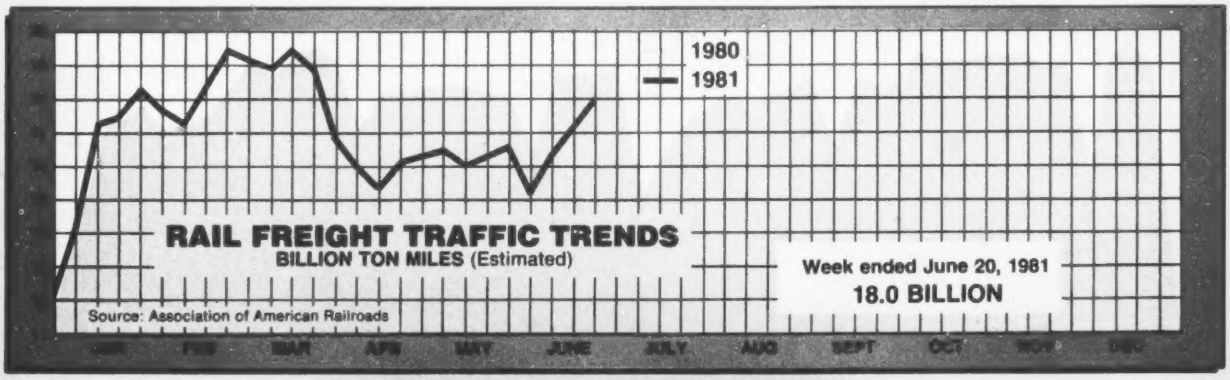
- *Egyptian Railroad Organization.*—Ordered 92 1,500-hp diesel-electric locomotives from the Diesel Division of General Motors of Canada Ltd. at a cost of $100 million. This brings to 192 the total number of locomotives ordered by Egypt from GM Canada over the last five years. The purchases are financed by the Canadian Development Agency (17%), the Export Development Corp. (70.5%), and by the Egyptian Railroad Organization (a down payment of 12.5%).

- *Milwaukee Road.*—Has begun a $15.3-million track-rehabilitation program between New Lisbon and Wausau, Wis., which will involve insertion of 111,000 new crossties, installation of 41 miles of continuous welded rail, and placement of 152,000 cubic yards of ballast.

- *Norfolk & Western.*—Applied to the Federal Railroad Administration for permission to install a traffic control system between St. Charles, Mo., and Wentzville, approximately 22 miles.

- *Southern.*—Asked the ICC for authority to issue, after competitive bidding, equipment trust certificates in the amount of $24 million to help finance the acquisition of 239 3,600-cu-ft, 100-ton capacity covered hopper cars; 97 2,100-cu-ft, 100-ton capacity limestone hopper cars; and 20 GP-50 diesel-electric locomotives.

- *Washington Metropolitan Area Transit Authority.*—Ordered an additional 200 rapid transit cars from Breda Construzioni Ferroviarie of Pistoia, Italy, at a cost of approximately $200 million. WMATA thus exercised an option that was contained in an earlier order for 94 cars, the first of which will be delivered early next summer. Delivery of the order for 200 more cars will take place between 1983 and 1986. The Urban Mass Transportation Administration is paying for 85% of the cars.


RAIL FREIGHT TRAFFIC TRENDS
BILLION TON MILES (Estimated)

Source: Association of American Railroads

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UP's marketing philosophy: "Let's try it"

July 27, 1981

RAILWAY AGE

THE ERA OF THE GIANTS

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July 27, 1981

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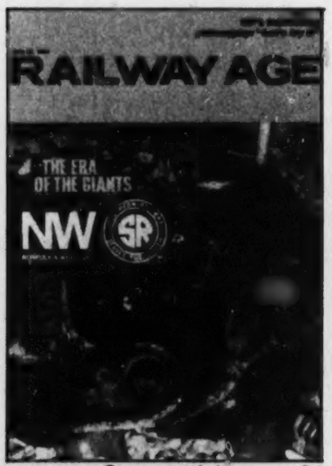

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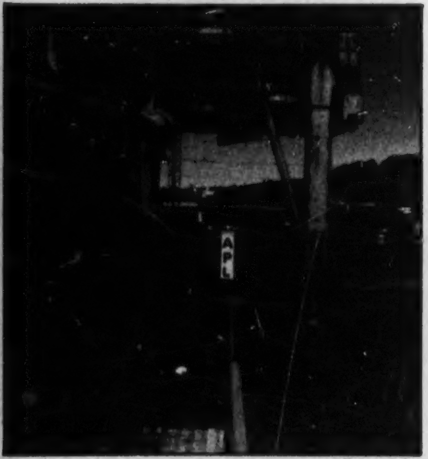

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24 One system, one sales team
In many respects, Norfolk & Western and Southern will retain their separate identities after merger into NWS—but when it comes to sales and service, they will speak with a single voice.

30 UP's marketing philosophy: "Let's try it"
Once known as an operating man's railroad that ran by the operating department's book, UP is fast becoming a marketing man's railroad willing to take risks to prove that it is ultimately a *customer's* railroad.

37 Contract Car Repair Directory

80 Quick-Car keeps busy despite rail-work lag
At two of its four shops, FreightMaster's Quick-Car is filling a temporary void in railcar work with non-rail jobs for the parent company.

82 Track improvements boost Tucumcari traffic
Through subsidiary Cotton Belt, Southern Pacific paid $57 million for Rock Island's Tucumcari line and is now rebuilding it at a cost of $97 million; the results are already showing up in traffic volume.

90 Railview: Coal vs electrification
Former CNJ President Perry M. Shoemaker contends that modern coal burning locomotives will promote the national interests of defense and energy conservation and the economic interest of railroads.

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12 Milwaukee mounts new TOFC push
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COVER: Photo by Roy H. Blanchard, Jr.

Market

CARLOADINGS

Loadings of revenue freight in the week ended July 4 totaled 405,271 cars, according to the Association of American Railroads. This was an increase of 59,901 cars, or 17.3%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended July 4 are estimated at 17.1 billion, an increase of 18.4% above the corresponding week of 1980. Both weeks included the Independence Day holiday.

REVENUE FREIGHT CARLOADINGS

Commodity	July 7 week	June 27 week
Grain	23.420	25.868
Farm products	3.137	3.858
Metallic ores	36.822	39.086
Coal	109.480	125.906
Crushed stone. gravel & sand	12.658	13.810
Nonmetallic minerals	14.558	14.445
Grain mill products	12.179	13.789
Food and kindred products	13.725	16.033
Primary forest products	14.920	18.377
Lumber & wood products (except furniture)	6.841	8.682
Pulp. paper & allied products	18.388	20.078
Chemicals & allied products	23.886	25.540
Petroleum products	4.505	4.832
Stone. clay & glass products	13.193	14.064
Coke	6.432	7.143
Metals & products	14.967	15.932
Motor vehicles & equipment	16.790	20.235
Waste & scrap materials	10.471	12.124
Forwarder & shipping assn. traffic	9.481	10.106
All other carloads	39.244	42.229
LCL traffic	174	199
Total cars loaded	**405,271**	**452,336**
Cumulative total,	1981	1980
27 weeks	**11,174,239**	**11,828,405**
Estimated revenue ton-miles (billions). 27 weeks	**467.4**	**474.6**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended June 27 totaled 35,079 cars (7.1% above the corresponding 1980 week) and 62,285 trailers or containers (up 2.1% from 1980). Cumulative volume for the first 26 weeks of 1981 is 843,450 (down 0.7% from 1980) and 1,525,140 trailers or containers (down 1.3% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the nine-day period ended June 30 totaled 7.3 million tons (up 9.2% from 1980). Cars loaded totaled 102,215 (up 9.9% from 1980).

- *California Department of Transportation.*—Awarded a $278,000 contract to UTDC (USA) Inc. for the provision of professional services toward the upgrading of the San Francisco-San Jose rail commuter service. Southern Pacific operates the service under contract to Caltrans. The capital improvement program now being undertaken by Caltrans involves acquisition of new locomotives and new bi-level cars as well as facility improvements.

- *CP Rail.*—Ordered 165 container flatcars from National Steel Car Corp. at a cost of approximately $9.8 million.

- *New York City Transit Authority.*—Awarded a $15-million contract to the GSI Engineering Division of General Steel Industries and its licensee, Buckeye Steel Castings, for steel, coil spring truck castings to begin a retrofit program for NYCTA's fleet of R-46 cars. Deliveries of the GSI-designed trucks will begin in December. Replacing the trucks on all 754 R-46 cars will require 2½ years and about $45 million worth of new trucks. Buckeye will serve as prime contractor. The contract calls for the initial production of 500 truck castings with options for a second 500 and then a final 548.

- *Freight cars and locomotives.*—The following report has been received from the AAR and the ARCI:

DELIVERED

	May		April	Five Months	
	1981	1980	1981	1981	1980
Built new by carbuilders	3,779	7,484	3,792	21,754	38,039
Built new in RR shops	364	589	453	1,841	2.398
Built new—total	4,143	8,073	4,245	23,595	40,437
Rebuilt	125	188	125	571	795
TOTAL DELIVERED	**4,268**	**8,261**	**4,370**	**24,166**	**41,232**
Locomotives	67	167	70	325	855

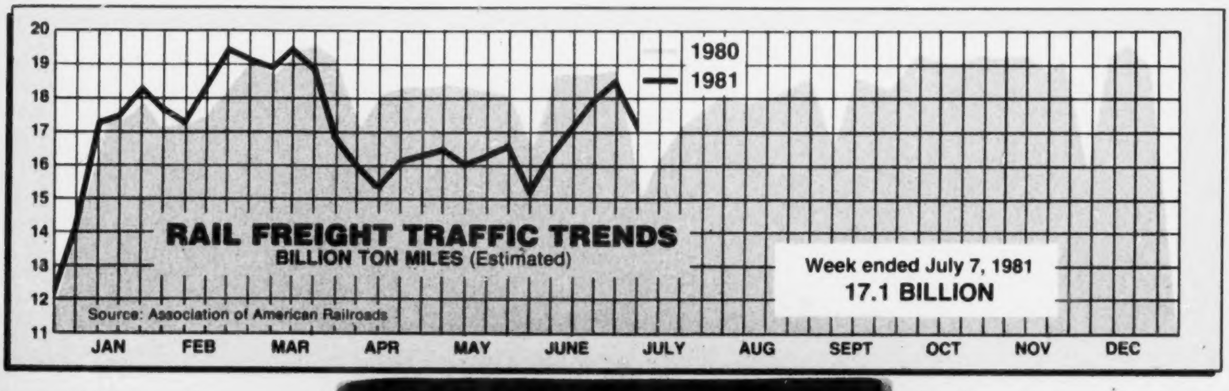
ORDERED

	May		April	Five Months	
	1981	1980	1981	1981	1980
To be built new by carbuilders ..	1,791	3.882	1,737	9.393	19.264
To be built new in RR shops ...	0	1.862	25	25	2.877
To be built new—total	1,791	5.744	1,762	9,418	22,141
To be rebuilt	500	0	0	1.100	869
TOTAL ORDERED	**2,291**	**5,744**	**1,762**	**10,518**	**23,010**

ON ORDER AND UNDELIVERED

	June 1		May 1	Average backlog	
	1981	1980	1981	1981	1980
To be built new by carbuilders ..	32,900	78.911	35,920	38.459	94.749
To be built new in RR shops ...	2.688	6.731	3,052	3.475	5.633
To be built new—total	35.588	85.642	38,972	41.934	100.382
To be rebuilt	529	174	154	268	492
TOTAL ON ORDER	**36,117***	**85,816**	**39,126**	**42,202**	**100,874**
Locomotives	287	953	341	407	1.146

*Due to revisions and cancellations of some orders. the June 1. 1981. backlog has been reduced by 1.032 cars.



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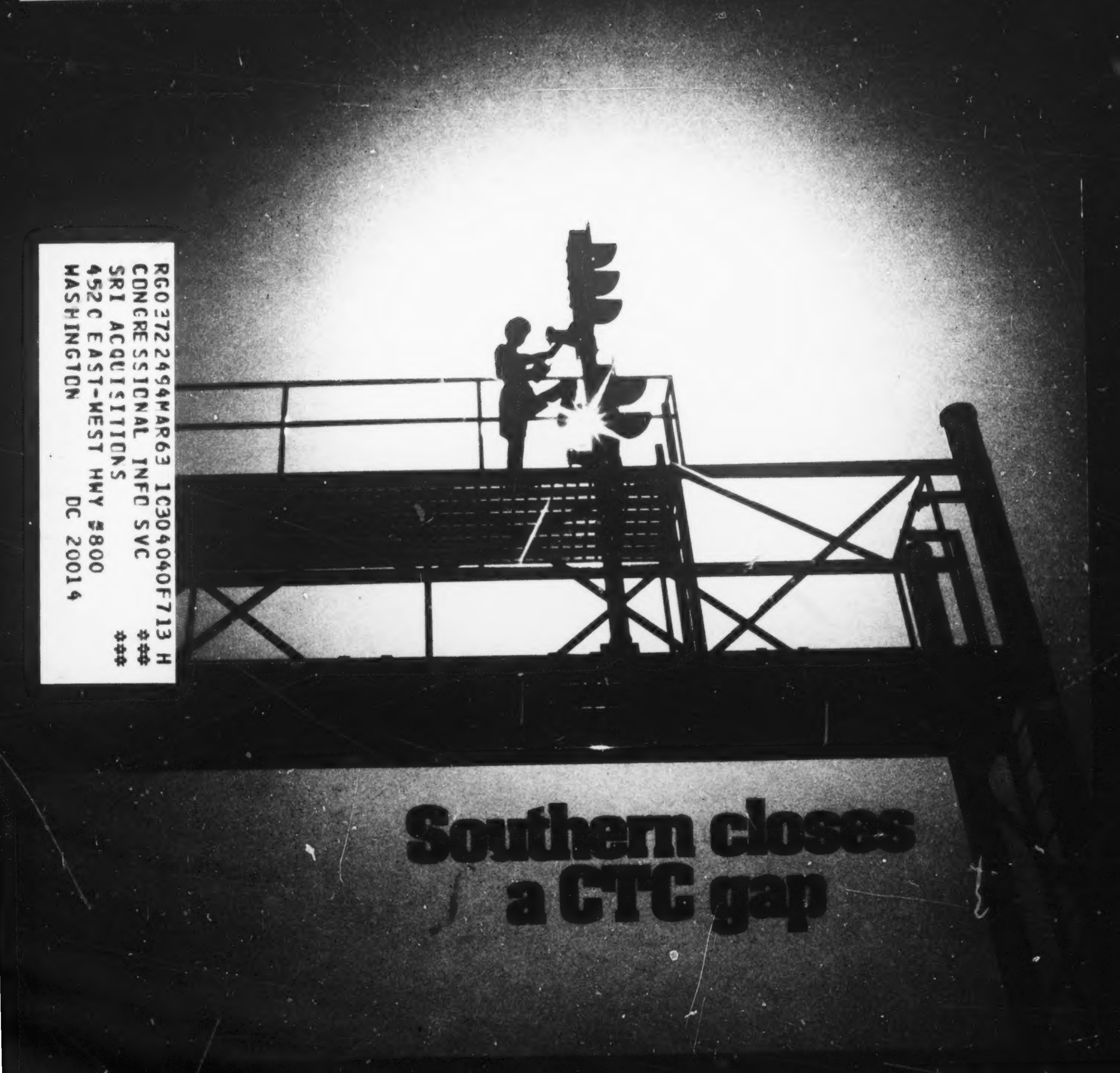
UMTA's Teele: The new policy on rail transit

August 10, 1981

RAILWAY AGE



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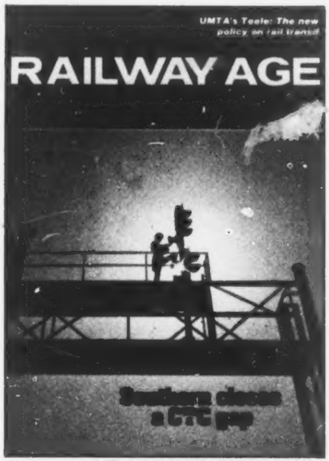
Southern closes a CTC gap

RAILWAY AGE
August 10, 1981

FEATURES


UMTA's Teele: The new policy on rail transit
RAILWAY AGE
Southern closes a CTC gap

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16 Southern closes a CTC gap
Southern will complete installation of centralized traffic control along the 140-mile route from Atlanta to Birmingham next year—an effort designed to match route capacity with increasing traffic demands, and to do it efficiently.

24 New Jersey electrifies—and re-electrifies
New Jersey transit is in the process of building, and re-building, catenary structures along commuter rail lines serving the New York area, as part of a $1.4 billion capital improvement program

28 A slow order for rail transit
UMTA Administrator Arthur E. Teele, Jr. responds to *Railway Age*'s questions concerning the future of transit and the Reagan Administration's controversial policies on new rail starts, transit revenues, wages and fares.

32 Portland light rail: Ready to start building
Portland Tri-Met's light rail line is made possible by Interstate Transfer funds. It's part of a $225 milion joint project with Oregon DOT that will ultimately connect downtown Portland with the east side suburbs.

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COVER: Safetran photo.

UMTA's Teele:

A slow order for rail transit

A practicing lawyer since 1976, Arthur E. Teele, Jr. earlier served in the U.S. Army for 11 years as a company commander and later as Senior Aide-de-Camp and Special Private Counsel to the Commander, XVIII Airborne Division. His appointment as Administrator of the Urban Mass Transportation Administration (UMTA) in April came after he worked as a national director of the Reagan-Bush campaign. Railway Age Associate Editor Bill Fahrenwald interviewed Teele in his Washington office.

Railway Age: Shortly before your confirmation you were quoted as saying, "The greatest potential for saving money and reducing oil imports can be achieved in addressing public transportation's ability to provide an alternate transportation choice for work trips." How are you trying to achieve this shift as UMTA administrator?

Teele: I don't think the shift is one that should be governmentally induced. I think government's role is to provide that important alternative. To that extent the marketplace forces—the cost of automobiles, the cost of operating automobiles, the congestion—will force the public to make an intelligent choice.

Do Americans want to continue their love of the automobile, or will there be a series of events—much like the Arab oil embargo of 1973—that will force the public to public transportation? As UMTA administrator I intend to ensure that we maintain that option for the American people through the presence of a viable alternative.

RA: Your position is that you are postponing new rail starts until the economy is ready to support them. How long is that postponement going to be?

Teele: Of course the postponement you're referring to is the one the President announced on Feb. 17 with his economic recovery package. It's not a postponement by the UMTA administrator or the Secretary of Transportation. It's based on a number of factors that include transportation issues, but transportation is not the sole, or, for that matter, the principal issue.

The principal issue is the economic condition of this country and the revitalization of the economy. And there is no segment of the economy on which inflation has a more severe toll than on public transportation with its heavily indexed wage rates. The postponement of new construction—to the extent that it will help the economy restore itself to its rightful place—is helpful directly to transportation.

If you look at the new-starts deferral the President announced from a purely transportation perspective you still have to question whether or not new rail starts have the national, overall impact of many other types of services such as expanding bus services. This is particularly true in light of population shifts in the Sunbelt and West. We must have a transportation system that is flexible enough to meet the new needs and the new transportation demands. A new rail start is not going to necessarily address that.

New rail starts are extremely capital intensive. The benefit is necessarily limited in scope to a very, very small or narrow geographic and population area—considering the nation as a whole—and in many ways it's not difficult to see how the President's postponement of new rail starts fits into a national economic scheme.

"You have to question whether or not new rail starts have the national, overall impact of many other types of services...."

UMTA Administrator Arthur E. Teele, Jr.

RA: How will this postponement affect the car-building and supply industries that are now available to construct transit systems? Will the industry be there when new rail starts are finally resumed?

Teele: We've taken every action to balance the expectations of various transit properties with this policy. And while this policy is clear, there are varying projects already under way. There are actions that, as administrator, I can take to minimize any potential adverse impact—and we're doing that. But I think it should be very, very clear: we're talking about five cities specifically and ten cities generally when we talk about the new rail starts delay. We're not talking about the United States, we're talking about five to ten specific transit areas—a very small percentage of the overall transit community.

The greatest demand for car building is in the replacement of existing systems rather than in the area of expanding fleets. Quite frankly, because of the historical sequence of events, where the American car builders were at one time a permanent and real force in this marketplace, today you will find that an alarming amount of this equipment is being purchased from abroad.

RA: The Administration wants to completely eliminate operating assistance over a period of time. It has been pointed out that this could lead to inadequate maintenance of equipment that will still be purchased with UMTA money. Is there a compromise that can be worked out to provide some maintenance money?

Teele: First of all, let's put the record straight. 80% of the operating and maintenance [O&M] money you're talking about is used for wages. It's not used for renovation or restoration, it's used for wages. Less than 15% is used for maintenance. Actually, less than 9% is more in line—that's for non-labor maintenance. When you talk about O&M money you're talking about labor funds to pay the wages for operating the system.

We have earmarked money from our capital program—a sizeable amount of money—for restoration, refurbishing, and revitalization of equipment as a capital cost.

We're concerned about maintenance programs and we have taken extraordinary actions in the area of life cycle costing and other related areas. We're working with both the transit community and labor to ensure maintenance. We believe we can get the best consideration for maintenance by putting the additional pressure to maintain equipment on transit agencies through a more rational capital replacement program than by going into the shop foreman's office with federal inspectors telling them how to run their maintenance shop.

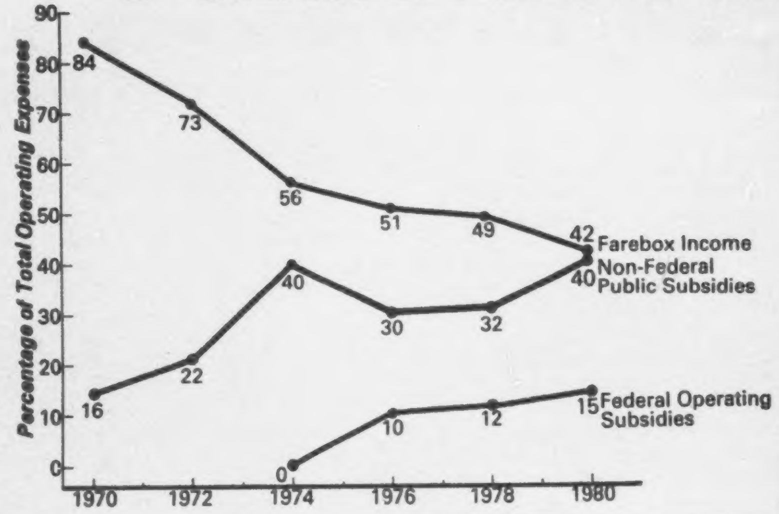
RA: Is there room for compromise on operating assistance? Would you be willing to consider a reduced level of aid if innovative ways could be found for cities to come up with a greater percentage of their costs?

Teele: We have a policy to encourage local transit properties to dedicate a local source of funding and revenue for transit operations. That is a stated goal and policy of this administration. As administrator I attempt to scrutinize and rationalize any grant or administrative action with a view toward cooperating and assisting those communities that have a dedicated source of funds.

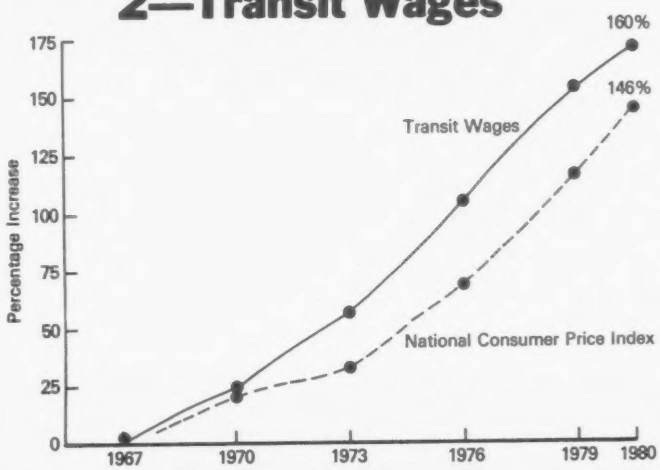
We are philosophically committed to a phase-out of operating subsidies. There is nothing in the record to suggest that when this so-called temporary fix was passed in 1974—designed to put transit operations on a long term secure footing—there is nothing in the record to suggest that operating subsidies have done that. We're locked-in to our position, but someone once said that politics is the art of compromise.

RA: Is your primary objection to operating assistance the fact that it has promoted high labor costs?

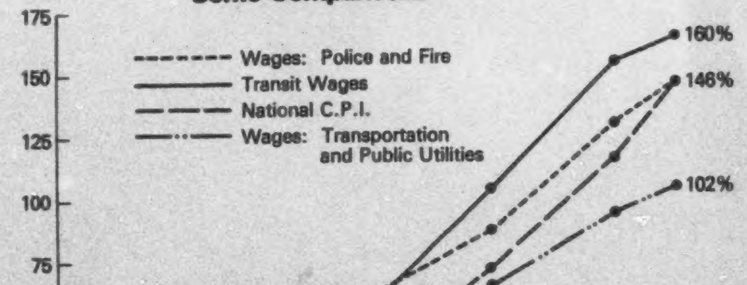
Teele: I wouldn't want to blame it all on labor costs. I think it [operating assistance] has promoted a degree of inefficiency in the overall management of transit operations, including labor costs. Transit management has not had to pay as close attention to the details because there was that federal pot of dollars at the end of the bargaining table.



1—Sources of Transit Revenue



2—Transit Wages



3—Transit Wages:

Some Comparisons

[illegible] [see chart 1] where transit was as it relates to the source of funding, you will see what has happened by the line tracing non-federal public subsidies. In a two year period, 1974-1976, the federal dollars went from zero to 10%—Section Five of operating subsidies—and the percentage of non-federal operating subsidies dropped by the corresponding amount. Basically, there was a transfer.

Of course, the wage chart [chart 2] tends to indicate that transit wages have historically been very close to the Consumer Price Index [CPI] up until about 1972. But in 1974 the gap widened. I think the more graphic chart [chart 3] is the wage trend that reflects transit workers against municipal police and fire and all the transportation and public utility workers against the CPI.

What you can see is that transit wages stayed right in the pack until 1974. In 1974 they broke out of the pack and have just clearly outstripped everything in the comparable fields. In 1980, using 1967 as a base year, the CPI represents a 146% increase and the transit workers represent 160%, which is a significant statistical difference.

There are some responses to this. What transit labor would suggest is that before 1974 transit wages were artificially and arbitrarily held below that of other comparable workers and there is some evidence to suggest that they were so restrained before 1974. Labor would say this period between '74 and '81 represents merely an adjustment.

RA: Given that wages are one of the major problems promoted by operating assistance, would there be any interest from your agency in providing block grants that would somehow isolate wages from being federally funded?

Teele: Block grants are a very exciting, interesting proposal. We are looking very closely to determine the applicability of a modified block grant for transit agencies. We would, of course, oppose the use of block grant funds for operating subsidies, even if it were five or ten percent. The question is a bit more flexible if it deals with non-labor related costs for block grants. But this administration unalterably opposes the use of operating funds in a block grant concept.

RA: Residents of cities like Chicago, New York, and Washington have seen hefty fare increases, taking some of the force away from your argument that transit fares are not keeping pace with inflation. Do you think further major fare increases are necessary, or, put another way, what price should the average bus rider pay?

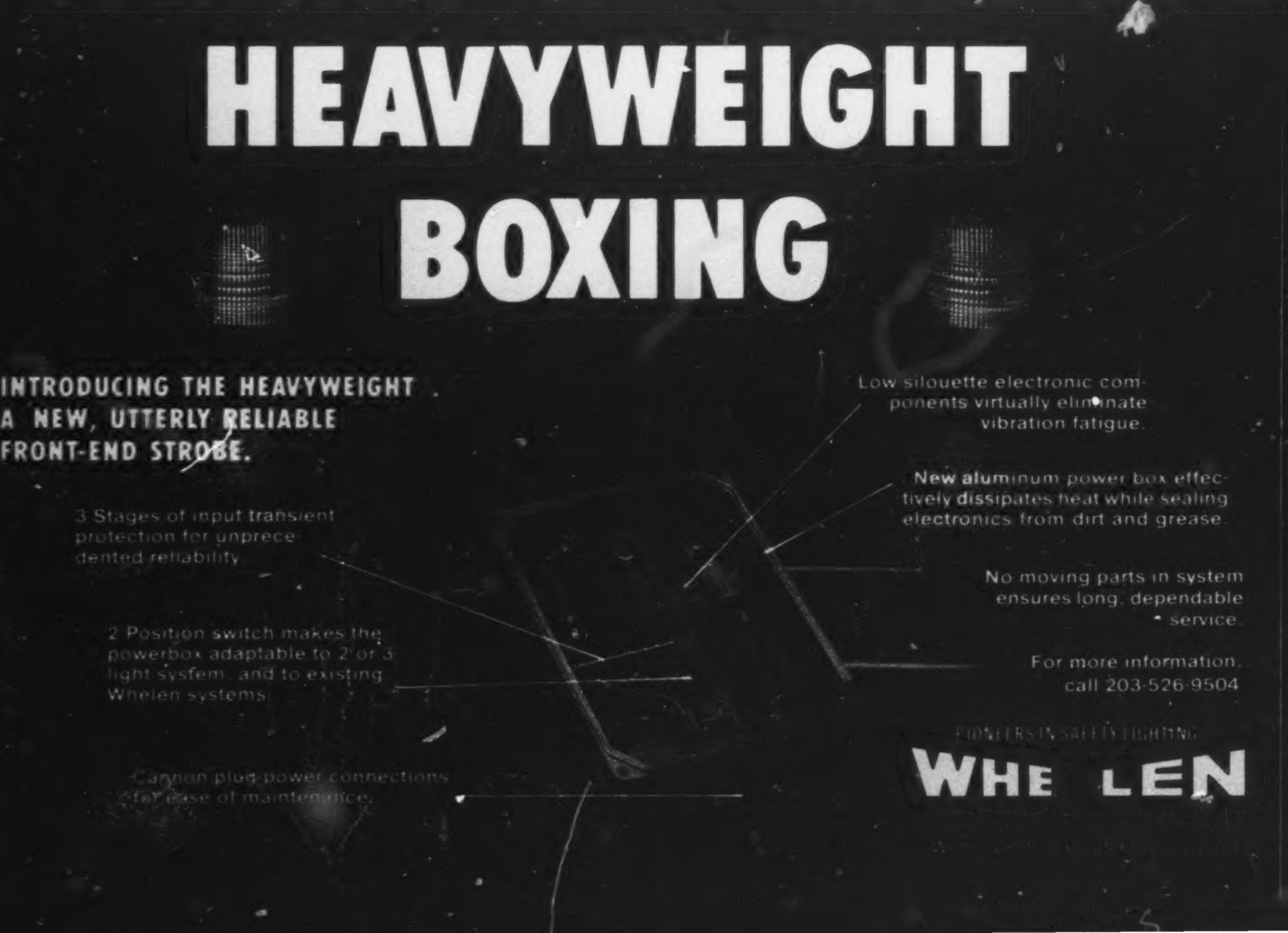
Teele: You know, that's a hard question. That's really not a question that lends itself to a federal bureaucrat trying to provide an answer. This administration believes that the unit of government that is closest to the people should be most responsive to the people and should make determinations regarding these matters. Fares are governed by forces outside of local government's control—such as the cost of fuel, cost of a bus, etc.—but essentially fares are a mixture of a number of variables that have to be rationalized at the local government level.

It's not just a question of whether the average fare should be 50 cents, or a quarter, or a dollar, for that matter. Each locality must tailor its services to its needs. We believe that the total fare box should somewhat represent the cost of delivering that service, less other public and non-public subsidies such as advertising on the buses or rental of space in a terminal. Obviously a dedicated source of funding could translate into a lower farebox.

The question of fares is a very complicated, convoluted issue that doesn't lend itself to a federal policy except to say that the federal policies in the past have in fact restrained a rational fare policy and have suggested that fares should be kept as low as possible.

RA: Should UMTA assure the nation's poor of a basic level of transportation?

(Continued on page 39)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A slow order for rail transit

(Continued from page 30)

Teele: I think social responsibilities belong at the local and state level first. We will continue to study social problems as they relate to transportation. But I don't think social concerns should necessarily be the overriding concern. The overriding concern in UMTA is a rational overall transportation policy that seeks to rationalize social, economic, environmental and energy related subpolicies that interface with a national public transportation policy.

RA: What do you think about the private sector's role in providing transit?

Teele: The private sector's involvement in the expanding transit industry as we see it in the 1980s is probably one of the more exciting possibilities that we face. I see a new partnership between public and private transit. Private transit will either work at the local level with public transit and metropolitan planning organization boards or, in some cases, public agencies will sub-contract services. This has happened particularly in the area of the elderly and handicapped across this country. I don't see the federal government participating on a financial basis with the private sector and I don't see the federal government attempting to coopt the private sector into the federal government.

RA: Is there going to be any UMTA involvement in the transfer of Conrail commuter services to Amtrak or the local transit authorities in the northeast?

Teele: There is UMTA involvement in that. I have designated my chief counsel to work very closely with the Secretary of Transportation's general counsel. UMTA's very much involved in an in-house way. We do not have the lead. The Federal Railroad Administration has the lead, and we have deferred to them.

We have taken a number of steps to ensure that the commuter interests are fully understood by the office of the Secretary. Secondly, we have reorganized our railroad technical assistance office. We have transferred it from transit assistance to the policy office and have beefed it up. We are in virtually day-to-day contact with the transit authorities that we deal with on non-commuter rail matters and we're expanding that to a team that has contact with them in the policy office that now is dealing with them on potential commuter rail problems.

RA: I understand you are promoting some legislation that will resolve the handicapped transit issue.

Teele: Senate bill 1160 contains legislative authority that in effect would modify the existing 504 regulations from full [handicapped] accessibility to a local option.

The court, in the case of APTA [the American Public Transit Association] versus Lewis, has returned our 504 regulations for a review to determine whether or not we have sufficient statutory or regulatory authority to issue those regulations. That remand by the court has provided us with a unique opportunity to amend the regulations. I would imagine that our amended regulations would closely conform with the pre-504 regulations that require "best effort" to provide for alternate service for handicapped.

RA: At a recent hearing, Rep. Benjamin [D-Ind.] voiced concern that the administration was more sympathetic to the interests of the oil producers' lobby than that of the transit users. And there are those who note your own resume contains little of direct application to the transit industry. Do you feel that the administration—and you as its appointee—are committed advocates for the needs of transit users?

Teele: I am, and I'm sure the administration is. ■

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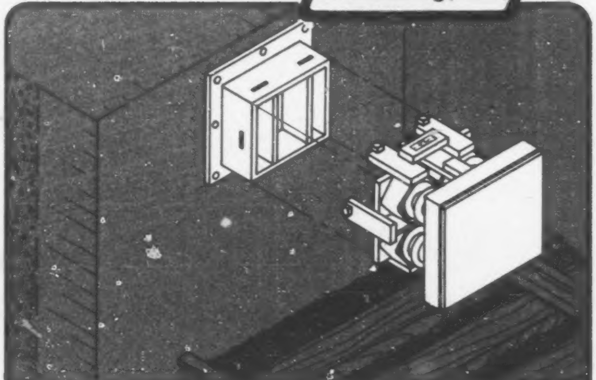

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Market

CARLOADINGS

Loadings of revenue freight in the week ended July 18 totaled 423,607 cars, according to the Association of American Railroads. This was an increase of 20,106 cars, or 5.0%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended July 18 are estimated at 17.8 billion, an increase of 7.0% above the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity	**July 18 week**	**July 11 week**
Grain	23,820	20,132
Farm products	3,936	3,705
Metallic ores	40,624	39,068
Coal	119,033	100,464
Crushed stone, gravel & sand	13,238	13,185
Nonmetallic minerals	15,747	15,094
Grain mill products	13,583	12,313
Food and kindred products	14,622	13,789
Primary forest products	18,221	16,709
Lumber & wood products (except furniture)	7,525	6,193
Pulp, paper & allied products	17,668	16,095
Chemicals & allied products	23,558	24,113
Petroleum products	4,877	4,936
Stone, clay & glass products	13,919	13,843
Coke	6,250	6,780
Metals & products	14,856	13,858
Motor vehicles & equipment	12,725	13,206
Waste & scrap materials	11,316	10,395
Forwarder & shipping assn. traffic	8,326	7,852
All other carloads	39,583	36,659
LCL traffic	180	180
Total cars loaded	**423,607**	**388,569**
Cumulative total,	1981	1980
29 weeks	**11,986,387**	**12,607,624**
Estimated revenue ton-miles		
(billions), 29 weeks	**501.4**	**507.0**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended July 11 totaled 30,118 cars (8.4% above the corresponding 1980 week) and 51,704 trailers or containers (up 3.5% from 1980). Cumulative volume for the first 28 weeks of 1981 is 906,666 cars (up 0.3% from 1980) and 1,635,436 trailers or containers (down 0.5% from 1980).

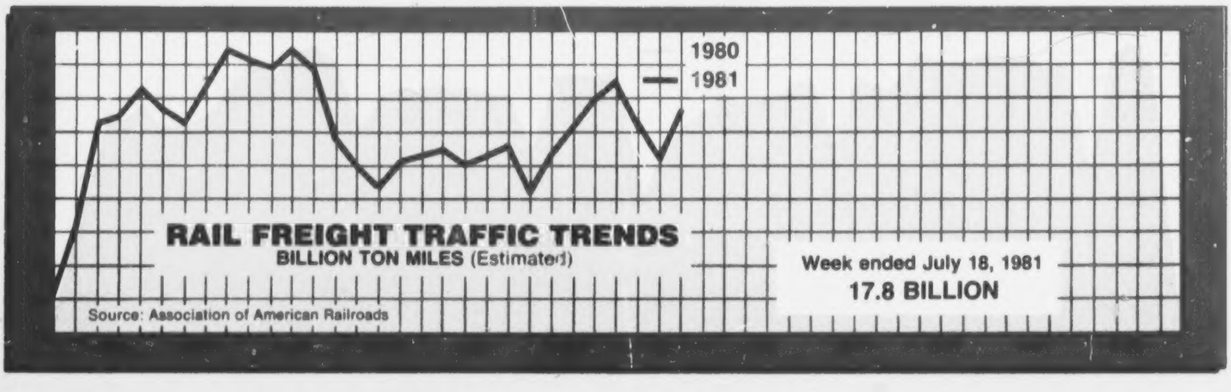
- *Chessie.*—Formally opened, on July 16, a $33-million iron ore transshipment dock at Toledo, Ohio. The new facility, which is operated by Chessie System roads and owned by the Toledo Ore Railroad Co., a Chessie subsidiary, features an 8,140-ft-long, computer controlled conveyor belt system to handle and store taconite ore pellets delivered to Toledo by a new generation of 1,000-ft-long self-unloading boats.

- *Conrail.*—Announced the sale of its wholly owned subsidiary, Excelsior Truck Leasing (ETL) Co., for $23 million. Herbert S. McDonald, Inc., a company formed by the president of ETL and bearing his name, acquired Conrail's 100% interest in the company. ETL fabricates a variety of special purpose vehicles for lease or sale. They range from small pickup trucks with special bodies to larger trucks with cranes and other heavy equipment. Many are adaptable for use as hi-rail vehicles.

- *Southern.*—Has begun full-scale operations at a new $3-million track material manufacturing facility at Norris Yard, Birmingham, Ala. The plant manufactures spring frogs and other track related equipment for use throughout the Southern system.

- *Southern Pacific.*—Will lease and operate a new $55-million intermodal yard to be built at San Pedro, Calif., and jointly financed by the ports of Los Angeles and Long Beach. The 114-acre yard will be able to handle unit trains of up to 50 cars. It will be constructed in four stages; the first is to be completed in late 1983 and the last in 1995. Said Arthur Goodwin of the Port of Los Angeles: "We feel that when the rail yard is completed it will be the largest terminal west of the Mississippi, if not in the United States."

- *VIA Rail Canada.*—Has taken official delivery of its first LRC (light, rapid, comfortable) train set from Bombardier Inc. The train is the first of an order for 50 coaches and 21 locomotives, all to be delivered by the end of this year. Initially, said VIA Rail President Frank Roberts, LRC trains will be used to familiarize employees with the new equipment and for promotion purposes in major population centers. The trains will go into revenue service between Toronto and Montreal this fall; service will gradually be extended to other cities in the Quebec City-Windsor corridor. Roberts said a second order for LRC equipment will be placed "as soon as VIA has familiarized itself with the LRC and has established that the trains are living up to expectations."



Crossing protection: A safety program that works

August 31, 1981

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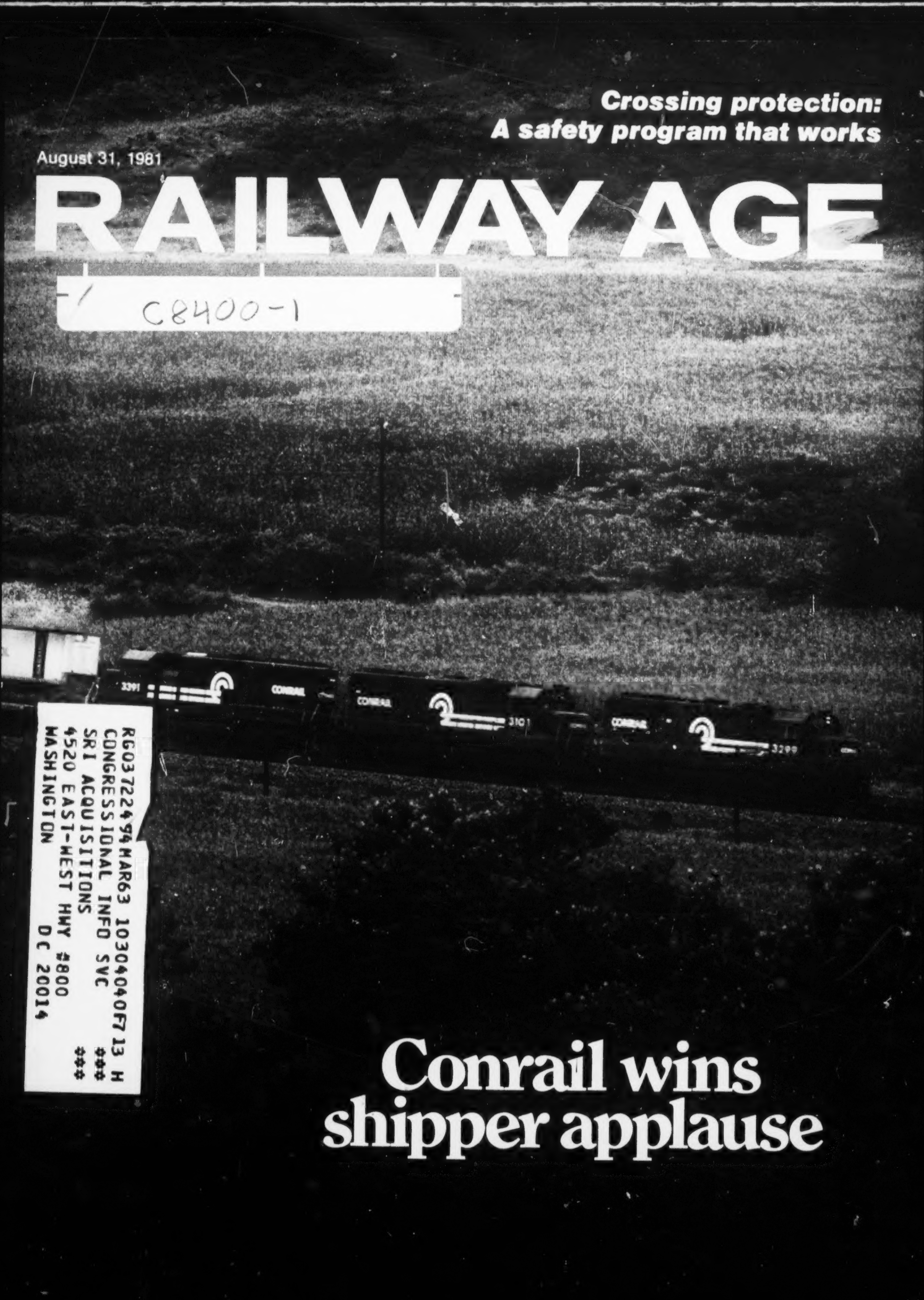

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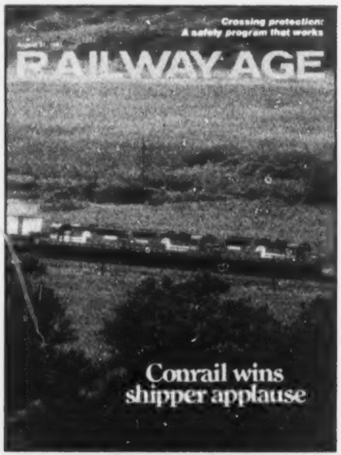
Conrail wins shipper applause

RAILWAY AGE

August 31, 1981

FEATURES


Crossing protection: A safety program that works
RAILWAY AGE
Conrail wins shipper applause

Cover article, page 22

18 IMPACK: Itel picks a proven performer
Identical to Santa Fe's Ten-Pack except for the paint scheme, Itel's intermodal car has passed squeeze tests and is now going onto the market—for sale, not lease.

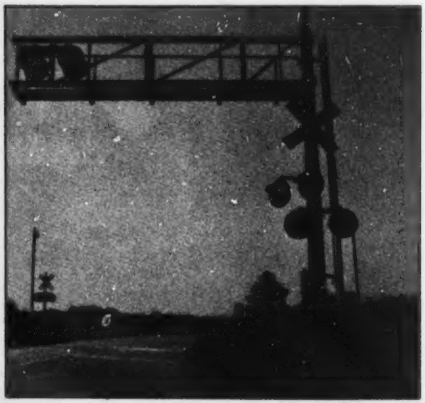
22 Conrail wins shipper applause
CR "is absolutely working better as a system than ever before," says Ford Motor Co.'s Richard Haupt—an opinion echoed by most CR customers surveyed by *Railway Age*.

25 Industrial development: CR's goal is clusters of customers
Conrail has renamed and redirected its ID department (it's now regional development) as part of an effort to win strong new markets and weed out weak ones.

30 Crossing protection: A safety program that works
A wide-ranging—and so far dramatically effective—program has depended heavily on federally funded protection. But highway "block grants" could endanger the program.

36 Pavings: Safety is more than gates, lights, and bells
Several special crossing surfaces now available are designed to reduce maintenance as well as provide a smoother, safer ride for the motorist.

38 Guiding a short line from survival to success
After five years on subsidy, the Hillsdale County Railway (62 miles of ex-PC) is headed for profitability. A new on-line power plant should make the difference.



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COVER: Conrail freight photographed by Roy H. Blanchard.

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A RAILWAY AGE SERVICE PAGE

REVENUES AND EXPENSES OF RAILWAYS

First quarter figures of calendar year 1981 (Revised)

(Dollar figures are stated in thousands: i.e., with last three digits omitted)

		Operating revenues				Operating expenses — Way & structures			Equipment					Operating ratio		Income after fixed charges		1981 Net Ry. operating income	Net income	
		Freight	Other	Total 1981	Total 1980	Total 1981	Total 1980	1981 Deprec.	Total 1981	Total 1980	1981 Deprec.	Total 1981	Total 1980	1981	1980	1981	1980		1981	1980
Amtrak	3 mos.	–	274,221	274,221	256,477	21,922	16,492	938	80,941	81,737	15,290	305,276	265,311	111.32	103.44	(45,730)	(15,676)	(31,054)	(45,730)	(15,676)
Atchison, Topeka & Santa Fe	3 mos.	568,310	12,923	581,233	511,416	86,629	79,615	3,558	127,646	114,634	20,818	534,575	479,782	91.97	93.81	40,168	26,651	35,357	28,616	20,383
Baltimore & Ohio	3 mos.	243,364	8,177	251,541	232,134	37,060	32,404	1,752	57,849	57,941	7,482	234,216	216,901	93.11	93.43	16,250	11,876	13,322	11,653	8,469
Bessemer & Lake Erie	3 mos.	20,895	1,496	22,391	19,103	2,729	4,222	682	2,461	4,953	1,352	16,777	20,294	74.92	106.23	7,329	169	2,190	3,904	379
Boston & Maine	3 mos.	28,903	1,653	30,556	27,944	5,567	5,064	282	8,088	7,791	360	29,945	28,656	97.99	102.54	1.626	(128)	678	1,430	(2,727)
Burlington Northern	3 mos.	897,876	25,230	923,106	679,867	124,378	94,348	5,680	199,590	144,031	18,010	820,691	601,319	88.90	88.44	125,123	95,999	67,339	90,019	76,445
Chesapeake & Ohio	3 mos.	238,880	8,055	246,935	207,528	35,234	31,253	1,878	49,642	50,645	3,227	216,182	193,817	87.54	93.39	52,451	26,154	16,149	37,812	20,589
Chicago & North Western	3 mos.	236,750	23,072	259,822	214,039	45,209	37,415	1,123	62,199	54,881	4,285	245,490	210,083	94.48	98.15	10,302	1,922	15,718	10,266	1,885
Chicago, Milwaukee, St. Paul & Pac.	3 mos.	91,396	11,552	102,948	106,449	9,942	42,954	1,309	35,364	43,135	4,388	110,664	163,724	107.49	153.80	140,736	(38,486)	(8,341)	140,655*	(40,845)
Clinchfield	3 mos.	26,648	253	26,901	19,406	4,245	3,487	111	4,083	3,011	984	19,473	14,905	72.38	76.80	3	–	7,946	–	–
Colorado & Southern	3 mos.	37,109	493	37,602	29,599	6,102	4,605	65	7,836	7,355	712	31,410	26,891	83.53	90.85	12,689	7,321	4,217	10,714	8,679
Conrail	3 mos.	840,731	170,933	1,011,664	965,935	158,164	147,319	5,317	277,667	280,004	35,509	1,060,829	1,044,844	104.85	108.16	(58,305)	(79,867)	(48,337)	(57,491)	(79,019)
Delaware & Hudson	3 mos.	27,254	902	28,156	28,672	5,166	4,294	134	8,752	8,814	629	31,679	29,404	112.51	102.55	(4,983)	(1,600)	(3,417)	(4,983)	(1,600)
Denver & Rio Grande Western	3 mos.	78,800	1,379	80,179	68,803	13,326	11,431	621	12,284	11,419	3,400	67,538	59,809	84.23	86.92	11,987	7,758	7,625	6,939	5,164
Detroit, Toledo & Ironton	3 mos.	21,208	964	22,172	20,566	2,721	2,360	172	5,923	5,864	1,124	20,676	19,558	93.25	95.09	683	883	1,506	683	883
Duluth, Missabe & Iron Range	3 mos.	14,575	309	14,884	15,620	5,804	6,224	874	3,258	(141)	695	18,887	15,182	126.89	97.20	(3,321)	1,440	(2,772)	(1,608)	907
Elgin, Joliet & Eastern	3 mos.	18,054	11,558	29,612	31,258	2,989	3,375	193	2,960	5,110	1,820	22,877	26,237	77.25	83.93	8,385	7,154	2,991	4,641	3,874
Florida East Coast	3 mos.	25,323	578	25,901	22,886	6,795	4,791	234	3,686	3,476	1,182	22,549	17,505	87.05	76.48	4,221	6,181	2,185	3,054	3,795
Ft. Worth & Denver	3 mos.	42,016	872	42,888	31,297	6,706	4,542	83	9,072	6,932	136	32,858	24,199	76.61	77.32	10,181	7,070	6,456	6,607	4,452
Grand Trunk Western	3 mos.	52,609	3,060	55,669	53,413	5,979	5,338	423	11,457	13,779	1,499	53,443	52,393	96.00	98.09	1,452	1,609	3,624	2,850	1,609
Illinois Central Gulf	3 mos.	256,269	20,087	276,356	248,680	45,884	37,287	1,8[illegible]	73,640	65,027	7,341	266,037	235,598	96.26	94.73	9,904	6,400	8,416	7,443	5,455
Kansas City Southern	3 mos.	71,475	3,576	75,051	66,989	13,945	10,826	764	16,377	15,207	3,964	64,916	57,266	86.49	85.48	9,263	9,346	8,081	7,175	6,846
Long Island	3 mos.	5,293	82,247	87,540	84,426	19,641	17,604	825	22,485	19,410	1,340	100,426	89,353	114.72	105.83	(13,038)	(5,127)	(11,813)	(13,038)	(5,127)
Louisville & Nashville	3 mos.	305,154	5,874	311,028	263,757	46,691	41,306	1,529	70,485	67,038	10,370	282,491	253,649	90.82	96.16	22,607	6,554	27,084	19,776	6,084
Missouri-Kansas-Texas	3 mos.	65,808	3,522	69,330	49,860	9,854	6,340	244	20,858	15,009	903	62,740	47,037	90.49	94.33	4,184	1,244	7,248	4,684	1,744
Missouri Pacific	3 mos.	464,644	13,713	478,357	398,809	67,471	46,560	2,415	107,560	94,476	14,857	412,321	348,541	86.19	87.39	58,985	42,298	48,842	39,196	29,226
Norfolk & Western	3 mos.	430,699	14,329	445,028	367,142	57,606	48,120	3,417	74,990	73,072	13,655	325,637	296,365	73.17	80.72	135,597	78,080	63,687	78,636	48,383
Pittsburgh & Lake Erie	3 mos.	17,843	1,476	19,319	18,920	2,865	2,788	–	3,126	1,090	234	18,267	14,536	94.55	76.83	(721)	1,270	900	(878)	863
St. Louis Southwestern	3 mos.	89,476	1,565	91,041	68,056	15,399	8,986	548	15,212	9,227	6,196	79,710	56,564	87.55	83.11	9,692	10,039	8,321	6,682	7,494
Seaboard Coast Line	3 mos.	332,524	10,695	343,419	302,172	54,226	48,045	2,319	79,196	69,966	9,286	305,869	273,633	89.06	90.55	64,499	40,887	33,935	60,804	38,527
Soo Line	3 mos	77,852	1,612	79,464	80,175	10,844	10,062	374	14,734	15,924	2,004	62,155	63,404	78.21	79.08	17,851	16,771	10,789	11,090	10,987
Southern	3 mos.	427,510	9,945	437,455	400,985	58,023	64,394	4,524	80,027	73,619	19,253	343,650	325,395	78.55	81.14	91,553	74,757	62,667	59,107	51,214
Southern Pacific	3 mos.	529,264	16,025	545,289	497,426	79,205	62,623	4,887	135,874	132,429	21,675	539,109	502,299	98.86	100.97	3,683	(9,449)	6,420	3,750	(6,687)
Union Pacific	3 mos.	527,287	7,741	535,028	477,482	70,345	77,535	2,930	99,384	92,769	24,509	439,921	417,875	82.22	87.51	81,856	47,967	66,065	52,768	35,423
Western Maryland	3 mos.	21,489	990	22,479	19,545	4,557	4,052	193	1,990	3,381	1,573	19,630	18,813	87.32	96.25	2,896	1,028	1,588	1,626	545

* Includes real estate sales

Market

CARLOADINGS

Loadings of revenue freight in the week ended Aug. 8 totaled 428,936 cars, according to the Association of American Railroads. This was an increase of 786 cars, or 0.2%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Aug. 8 are estimated at 17.9 billion, an increase of 2.2% above the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity	Aug. 8 week	Aug. 1 week	July 25 week
Grain	25,009	22,922	21,277
Other farm products	3,230	3,176	3,097
Metallic ores	38,497	37,991	36,929
Coal	127,728	128,728	127,119
Crushed stone, gravel & sand	12,626	13,463	13,466
Nonmetallic minerals	13,986	14,226	14,497
Grain mill products	13,251	14,061	13,938
Food and Kindred products	14,545	15,378	15,251
Primary forest products	18,466	18,676	18,302
Lumber & wood products (except furniture)	7,314	8,459	8,243
Pulp, paper & allied products	18,576	19,434	19,058
Chemicals & allied products	24,333	24,403	24,717
Petroleum products	5,180	4,909	5,118
Stone, clay & glass products	14,130	14,189	13,866
Coke	6,070	5,899	6,220
Metals & products	13,951	15,415	14,791
Motor vehicles & equipment	10,774	12,824	13,328
Waste & scrap materials	10,964	10,402	10,941
Forwarder & shipper assn. traffic	9,631	9,697	9,325
All other carloads	40,480	41,672	40,681
LCL traffic	195	194	181
Total Cars Loaded	**428,936**	**438,118**	**430,345**

	1981	1980
Cumulative total, 32 weeks	**13,284,496**	**13,884,089**
Estimated revenue ton-miles (billions), 32 weeks	**557.1**	**559.4**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Aug. 1 totaled 32,451 cars (6.3% above the corresponding 1980 week) and 60,802 trailers or containers (up 9.4% from 1980). Cumulative volume for the first 31 weeks of 1981 is 1,002,312 cars (up 0.9% from 1980) and 1,809,346 trailers or containers, virtually no change from last year.

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended July 21 totaled 4.6 million tons (down 4.9% from 1980). Cars loaded totaled 64,033 (down 9.7% from 1980). Cumulative loadings for 1981 were up to 143.5 million tons (down 2.6% from 1980).

- *Egyptian Railroad Organization.*—Ordered an additional 51 diesel-electric locomotives from General Motors of Canada Ltd. at a cost of approximately $55 million. This follows a $100-million order for 92 similar locomotives placed earlier this year (*RA*, July 31, p. 55). To help finance the orders, the Export Development Corp. of Canada and the Canadian International Development Agency are lending $135.4 million to the Egyptian Railroad Organization.

- *CP Rail.*—Ordered 165 100-ton-capacity container flatcars from National Steel Car Corp. at a cost of approximately $9.75 million. The cars will be used primarily to carry import/export (ISO) containers (two 40-foot or four 20-foot units). In domestic service, they will be able to carry two 44-foot, 3-inch or three 29-foot containers.

- *Santa Fe.*—Placed orders with Sperry Univac for two large-scale computer systems valued at more than $18 million. The Sperry Univac 1100/84 and 1100/82 microprocessors will be installed at Topeka.

- *Swift Independent Packing Co.*—Has acquired 96 new 23,500-gallon-capacity tank cars from General American and Trinity Industries Leasing Co. under long-term lease.

- *Freight cars and locomotives.*—The following report has been received from the AAR and the ARCI:

DELIVERED

	June		May	Six months	
	1981	**1980**	**1981**	**1981**	**1980**
Built new by carbuilders	3,442	7,521	3,779	25,196	45,560
Built new in RR shops	339	381	364	2,180	2,779
Built new—total	3,781	7,902	4,143	27,376	48,339
Rebuilt	80	106	125	651	901
TOTAL DELIVERED	**3,861**	**8,008**	**4,268**	**28,027**	**49,240**
Locomotives (new and rebuilt)	108	178	67	433	1,033

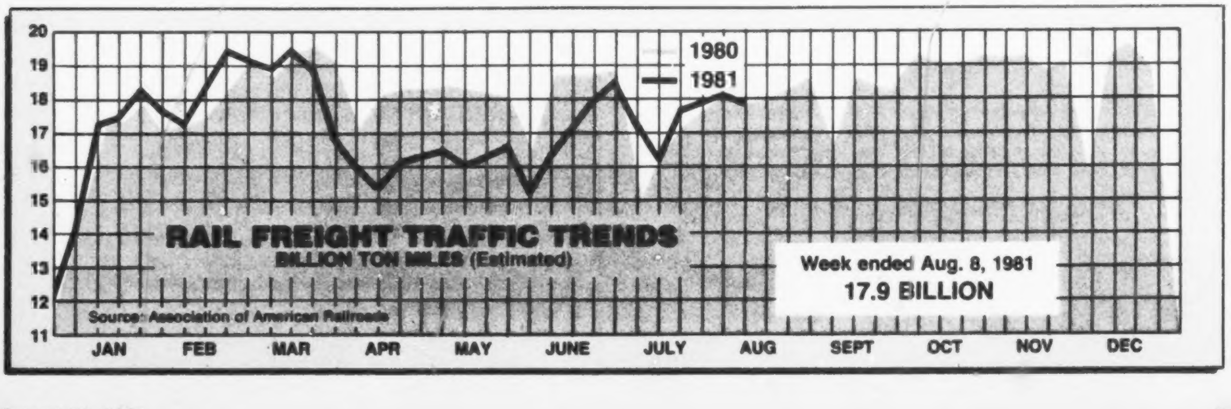
ORDERED

To be built new by carbuilders	927	3,144	1,791	10,218	22,408
To be built new in RR shops	228	0	0	253	2,877
To be built new—total	1,155	3,144	1,791	10,471	25,285
To be rebuilt	0	0	500	1,100	869
TOTAL ORDERED	**1,155**	**3,144**	**2,291**	**11,571**	**26,154**

ON ORDER AND UNDELIVERED

	July 1		June 1	Average backlog	
	1981	**1980**	**1981**	**1981**	**1980**
To be built new by carbuilders	29,744	71,701	32,900	37,007	90,908
To be built new in RR shops	2,577	6,350	2,688	3,325	5,752
To be built new—total	32,321	78,051	35,588	40,332	96,660
To be rebuilt	449	68	529	299	422
TOTAL ON ORDER	**32,770***	**78,119**	**36,117**	**40,631**	**97,082**
Locomotives (new and rebuilt)	196	787	287	372	1,086

*Due to revisions and cancellations of some orders, the July 1, 1981, backlog has been reduced by 641 cars.



RAIL FREIGHT TRAFFIC TRENDS

BILLION TON MILES (Estimated)

Source: Association of American Railroads

Week ended Aug. 8, 1981

17.9 BILLION

The uncommitted railroads: Wallflowers at the merger ball

September 14, 1981

RAILWAY AGE

Auto racks: Old problem, new solution

NO RUNNING BOARD
EXCESS HEIGHT CAR
7 OC SPRG D-5
3 IC SPRG D-5

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CONGRESSIONAL INFC SVC ***
SRI ACQUISITICNS ***
4520 EAST-WEST HWY #80
WASHINGTON DC 20014

RAILWAY AGE

September 14, 1981

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26 Auto racks: Old problem, new solution
An end door made up of hinged vertical "slats" is exciting widespread interest. It's lightweight, easily repairable, and comes within the clearance diagram.

34 Wallflowers at the merger ball
More than a dozen railroads—big, small, and middle-sized—are still without partners. Some could play key roles in shaping the era of the giants.

40 Santa Fe's born-again road switchers
Conversion of high-horsepower diesels into an efficient road-switcher fleet is just one of many activities that have earned ATSF's Cleburne shops an A-1 reputation.

48 Utility helps ICG upgrade a coal line
Hoosier Energy is advancing Illinois Central Gulf $9 million toward rehabilitation of a line that will serve one of the utility's generating plants.

54 Meet the Kankakee, Beaverville & Southern
It's one of many short lines being forged from the rejected trackage of big roads—lines that could become important feeders for the Class I's.

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10 90% of Amtrak survives cuts
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The uncommitted railroads: Wallflowers at the merger ball

RAILWAY AGE

Auto racks: Old problem, new solution

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Santa Fe
FEC
MKT
GT

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Santa Fe
2633

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Cover: Portec RAVE car by Lens-Art Photo.

Market

CARLOADINGS

Loadings of revenue freight in the week ended Aug. 22 totaled 438,519 cars, according to the Association of American Railroads. This was a decrease of 660 cars, or 0.2%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Aug. 22 are estimated at 18.3 billion, an increase of 2.1% above the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity	**Aug. 22 week**	**Aug. 15 week**
Grain	28,270	27,351
Other farm products	2,997	3,187
Metallic ores	36,813	38,411
Coal	129,908	130,619
Crushed stone, gravel & sand	12,549	12,530
Nonmetallic minerals	13,719	13,240
Grain mill products	13,539	14,132
Food & kindred products	15,629	15,054
Primary forest products	18,223	18,059
Lumber & wood products (except furniture)	7,307	7,180
Pulp, paper & allied products	19,280	18,725
Chemicals & allied products	25,324	25,087
Petroleum products	5,334	5,098
Stone, clay & glass products	13,525	13,489
Coke	6,424	6,537
Metals & products	14,134	14,010
Motor vehicles & equipment	13,267	12,693
Waste & scrap materials	11,788	11,587
Forwarder & shipper assn. traffic	9,503	9,292
All other carloads	40,783	40,662
LCL traffic	203	191
Total Cars Loaded	**438,519**	**437,134**
	1981	1980
Cumulative total, 34 weeks	**14,159,716**	**14,754,022**
Estimated revenue ton-miles (billions), 34 weeks	**593.6**	**594.8**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Aug. 15 totaled 33,308 cars (9.0% above the corresponding 1980 week) and 60,118 trailers or containers (up 7.9% from 1980). Cumulative volume for the first 33 weeks of 1981 is 1,067,748 (up 1.2% from 1980) and 1,928,490 trailers or containers (up 0.3% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Aug. 7 totaled 4.3 million tons (down 5.4% from 1980). Cars loaded totaled 56,903 (down 11.1% from 1980). Cumulative loadings for 1981 were up to 154.4 million tons (down 2.8% from 1980).

- *American Refrigerator Transit.*—St. Louis Refrigerator Car will refurbish 100 mechanical refrigerator cars for ART, a wholly-owned subsidiary of Missouri Pacific. The program will cost about $2 million and is scheduled for completion by the end of 1981. Work will include rebuilding of diesel engines and replacement of all major refrigeration components, and is designed to extend the life of the cars by 10 years. When the program is completed, ART will have a fleet of 249 cars available for use by frozen-food shippers located on MP.

- *Missouri Pacific.*—Applied to the FRA for approval to install a traffic control system between Taylor, Tex., and San Antonio, 112.3 miles. The system will replace existing automatic block signals.

- *North American Car Corp.*—Is acquiring 225 100-ton covered hopper cars from FMC's Marine and Rail Equipment Division for lease to FMC's chemical group. FMC's Green River, Wyo., plant will use the cars for shipment of soda ash.

- *Toledo Terminal Railroad Co.*—Will rehabilitate 14.32 miles of track and grade crossings at a cost of $1,015,917. TTRC is contributing $203,183 to the project; the remaining $812,734 is coming from the Federal Railroad Administration via the Ohio Rail Transportation Authority.

- *Freight cars and locomotives.*—The following report has been received from the AAR and the ARCI:

DELIVERED

	July		June	Seven Months	
	1981	**1980**	**1981**	**1981**	**1980**
Built new by carbuilders	2,864	5,455	3,442	28,060	51,014
Built new in RR shops	119	435	339	2,299	3,214
Built new—total	2,983	5,890	3,781	30,359	54,228
Rebuilt	47	4	80	698	905
TOTAL DELIVERED	**3,030**	**5,894**	**3,861**	**31,057**	**55,133**
Locomotives (new and rebuilt)	32	167	108	465	1,200

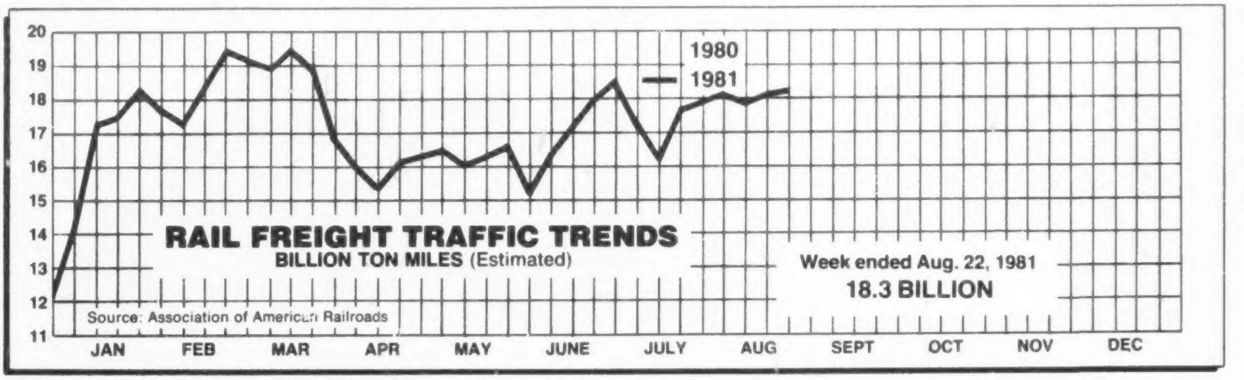
ORDERED

To be built new by carbuilders	1,315	3,393	927	11,533	25,102
To be built new in RR shops	0	0	228	253	2,877
To be built new—total	1,315	3,393	1,155	11,786	27,979
To be rebuilt	0	0	0	1,100	869
TOTAL ORDERED	**1,315**	**3,393**	**1,155**	**12,886**	**28,848**

ON ORDER AND UNDELIVERED

	August 1		July 1	Average backlog	
	1981	**1980**	**1981**	**1981**	**1980**
To be built new by carbuilders	23,809	67,934	29,744	35,121	87,626
To be built new in RR shops	2,458	5,914	2,577	3,202	5,775
To be built new—total	26,267	73,848	32,321	38,323	93,401
To be rebuilt	402	64	449	313	371
TOTAL ON ORDER	**26,669***	**73,912**	**32,770**	**38,636**	**93,772**
Locomotives (new and rebuilt)	306	517	196	362	1,004

*Due to revisions and cancellations of some orders, the Aug. 1, 1981 backlog has been reduced by 4,386 cars.



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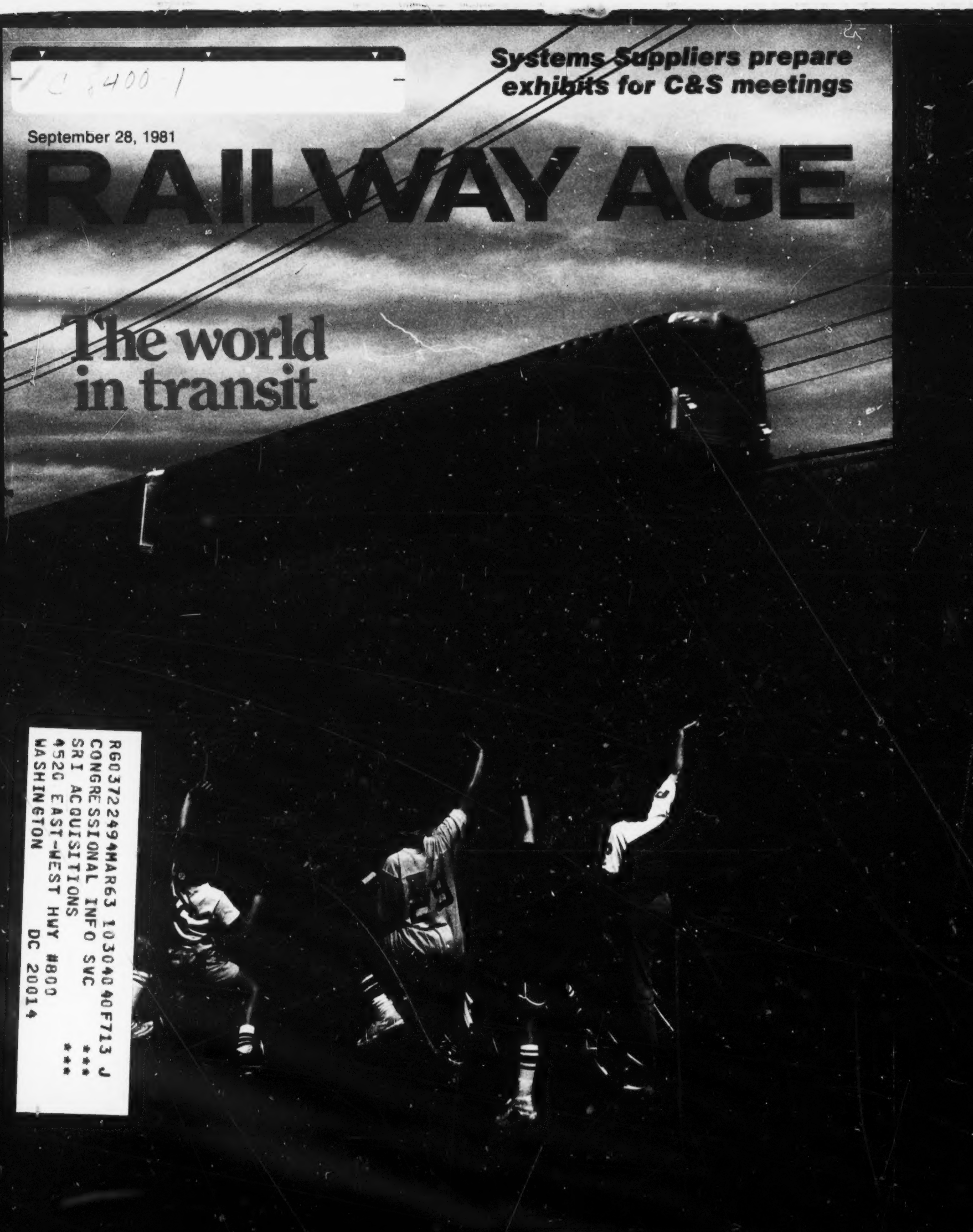
Systems Suppliers prepare exhibits for C&S meetings

September 28, 1981

RAILWAY AGE

The world in transit



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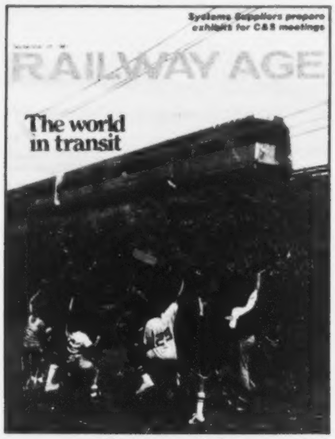
WASHINGTON DC 20014

RAILWAY AGE

September 28, 1981

FEATURES



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22 **Fuel cost: four new aerodynamics studies**
A study finds that while streamlined locomotives would reduce wind drag, a hood locomotive with "subtle" design changes can achieve the same saving.

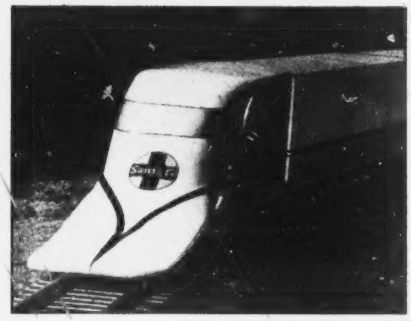
29 **Transit-car financing: A breakthrough?**
A new provision in the Internal Revenue Code could help New York save up to 20% on the purchase of nearly 1,400 new rapid transit cars.

39 **The world in transit**
As other countries turn more and more to the metropolitan railway for solutions to urban problems, only the U.S. seems to be out of step.

44 **Metropolitan railways around the world**
A graphic history of the growth of metros, supplemented by tables presenting parallel statistics of systems operating, building, or planned.

57 **International Public Transit Expo '81**
A preview of some of the rail-transit related products to be exhibited at a world-wide show sponsored by the American Public Transit Association.

62 **Systems Suppliers show set for Oct. 4 opening**
As AAR C&S Division members gather in Chicago, so will C&S suppliers—with exhibits that will fill more than 100 booths at the Palmer House.



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14 **ICC unit opposes UP/MP/WP union**
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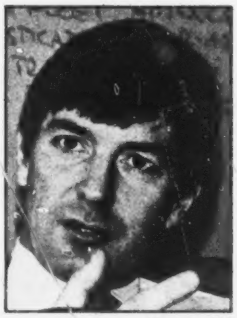

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COVER: PATCO (Lindenwold) line, photographed by Roy H. Blanchard near Collingswood, N.J.

RAILWAY AGE/News

Computers track roadway conditions

Fifteen MAINTAIN Indicators

	1978	1980
Overall Indicator (relates speed to traffic density lower number indicates low performance)	250	259
Tie Replacement Cycle (Years)	31.9	32.6
Tie Replacement Cycle (3 year average)	37.8[1]	32.2[2]
Rail Replacement Cycle (Years)	35.7	36.1
Rail Replacement Cycle (3 year average)	38.0[1]	34.7[2]
Ballast (cubic yards/mile)	85.0	98.0
Slow Order Mileage Ratio (percentage)	11.3	10.4
Surfacing Cycle (years)	5.5	4.2
Total Roadway Maintenance Cost per Track Mile	$8055	$9941
Maintenance Cost per Operating Expense Dollar	10.9¢	10.4¢
Total Roadway Maintenance Cost/Track Investment Dollar	22¢	26¢
Material Installed per Labor Dollar	93¢	$1.02
Operating Expense per Million Gross Ton Miles (MGTM)	$10,128	$12,182
Total Roadway Maintenance Cost per MGTM	$1,101	$1,268
Casualty Cost per MGTM	$258.32	$248.83

[1] Average of figures reported in 1976, 1977 and 1978
[2] Average of figures reported in 1978, 1979 and 1980

When looking at a section of track, you can easily tell whether it has had a long history of good or bad maintenance.

It is not as simple, though, to determine whether an entire Class I railroad is adequately maintaining its track structure. Even though a given railroad might have a history of investing heavily in its track, does a one, two, or three year deferral of some maintenance indicate trouble ahead? How do you measure such a thing—are casualties per million gross ton miles more or less important an indicator than the slow order mileage?

No one has yet come up with the definitive answer to these questions, but the Interstate Commerce Commission has developed a computer program that can give a general picture of a Class I railroad's overall maintenance performance.

David Stephenson, an ICC general engineer, has developed a picture of how individual railroads stack up against other railroads. The program is called MAINTAIN, and its information is available to any interested party.

Stephenson started developing MAINTAIN a little more than one year ago, using information already available through public sources. The program's data base was culled mostly from annual reports filed with the ICC by Class I roads. From this information, Stephenson developed 15 indicators of track maintenance trends, and Ira Winthrop, another ICC general engineer, wrote a computer program that presents a host of comparisons between the indicators.

Railroads and the Federal Railroad Administration have expressed great interest in the program. "Some of the ratios were similar to others they had seen, but no one had seen all the information gathered together for comparison in this manner," says Stephenson.

Stephenson stresses that no matter how many adjustments are made in MAINTAIN, it has certain limitations. "This isn't an answer," he says, "it's just a tool for analysts to decide whether to go further."

As such, it appears to be extremely useful. In the accompanying table, the 15 indicators are listed for railroad track maintenance programs in 1978 and 1980, the period now tracked by MAINTAIN. As data from future years are added, trends will become easier to spot, but it is clear that overall industry track maintenance improved during the three years.

The overall indicator relates speed to traffic density. It is not composed of the 14 other indicators as its name might suggest and, indeed, no summary or weighted average can be drawn from MAINTAIN. The overall indicator is based on an open ended scale in which higher numbers indicate improved performance.

In many of the other categories listed, industry performance improved. Casualty costs per mile, slow order mileage ratios, and surface cycle times all were down. Total roadway maintenance costs increased (perhaps due largely to inflation) but the cost per operating expense dollar fell slightly. Oddly, tie and rail replacement cycle times increased slightly from 1978 to 1980, due perhaps to recessionary pressures on the industry.

Do these averages accurately reflect nationwide performance? Take a look at two railroads in 1978 to see whether their known performance is properly reflected in the figures. One railroad, "A" is among the most prosperous and is an acknowledged leader in track maintenance. The other railroad, "B", is a weak character that lacks the resources of A.

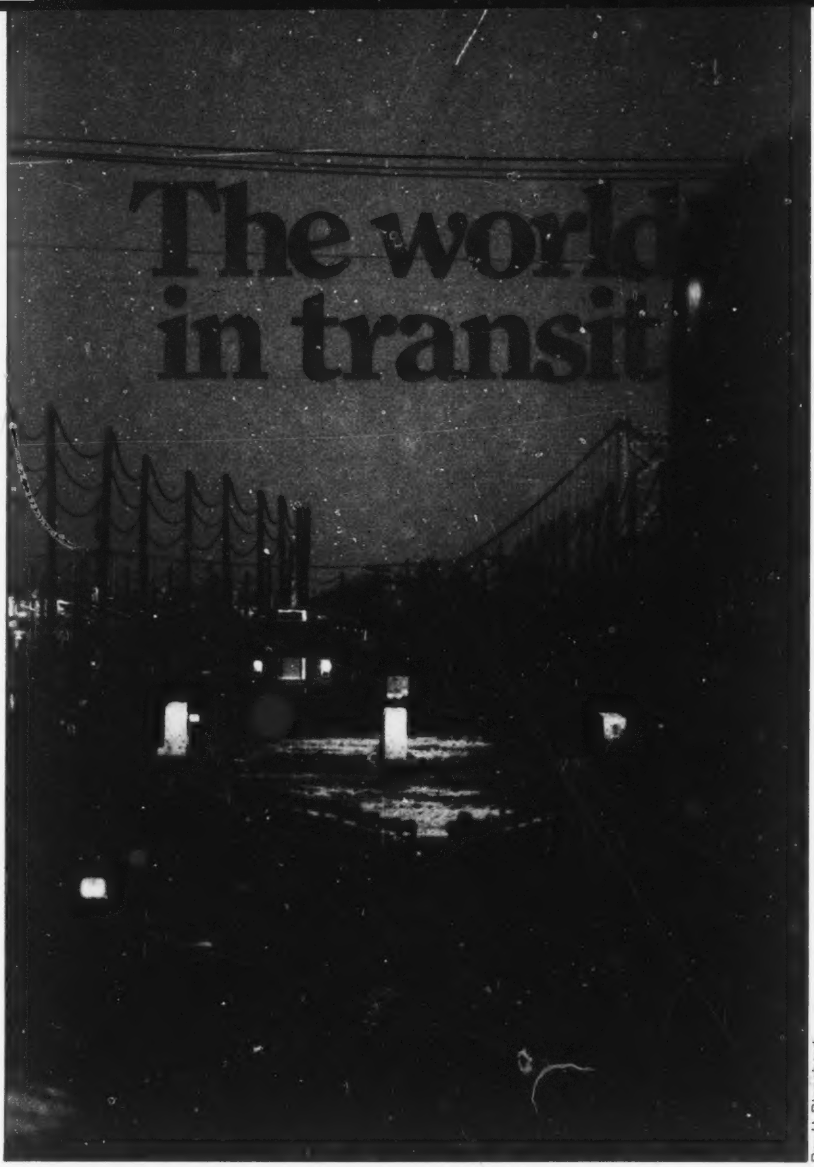
By giving the MAINTAIN computer a few simple instructions, Stephenson is able to call up a summary of performance indicators for A and B, as well as a comparison to the national average. Generally, the results seem accurate. The computer finds railroad B deficient in 13 of the 15 indicators. Railroad A, on the other hand, doesn't fail a single test. The overall indicator for A is 308 (very high) and B limps in at 184. As railroad B embarked on a track improvement program during 1979 and 1980, its performance was accurately followed by MAINTAIN.

It is through such specific comparisons of MAINTAIN to reality that Stephenson is gaining confidence that he has designed at least a good starting point for the development of a reliable tool that railroad managers and others can use when assessing their performance.

There are problems to be solved, as Stephenson illustrates with the results MAINTAIN shows for one successful railroad that has a high percentage of terminal track. "This railroad runs a pretty tight ship," says Stephenson, "but they received a low overall rating in this program. After studying the results for a while, it became apparent that their large amounts of terminal track skewed the results. So it's important when looking at this that you take into account the various things that can affect the outcome."

Stephenson is constantly looking for such anomalies—and for ways to correct them. That is why he is anxious to hear the reaction of others who may be more familiar with specific problems in MAINTAIN. Once these are worked out, Stephenson expects to have a good barometer of U.S. track maintenance practices, something he says, "You could put in front of somebody that would give them an overview fairly fast." ■

The world in transit


Roy H Blanchard

Cities all over the globe are increasingly turning to the metropolitan railway as the answer to a host of urban problems. But the actions (and non-actions) of the Reagan Administration are raising troubling questions about the future of rail transit in the U.S.

By ALBRECHT P. ENGEL,
Manager, Planning & Development
Transportation and Transmission,
Gibbs & Hill, and FREMONT FELIX,
Consultant, Gibbs & Hill

While many rail transit professionals make last minute preparations for participation in the much heralded Public Transit Expo 81, their thoughts must turn to the gnawing question of what the future holds. In contrast to the shadow cast over rail transit today by our national leadership, the atmosphere pervading the industry when the Expo 81 idea was born, more than two years ago, was one of considerable optimism. The expanding role of rail mass transit as an integral element in this nation's ground transportation system seemed assured. The unprecedented appearance of the President of the United States at the 1979 APTA conference in New York and his proclamation of the energy implications of mass transit was considered a capstone of the industry's long drive for recognition at the highest level. This in itself was quite an achievement for an industry that, only two years earlier, had been totally overlooked as an energy conservation alternative in that Administration's proposed energy bill.

With policy and priority seemingly well established at the close of the turbulent 70's, what appeared to lie ahead for rail transit in the 80's was a streamlining of administrative matters related to the federal funding process and the implementation of a rigorous set of technical guidelines to encourage a greater measure of industry standardization. What could be a better forum to exchange views on these issues than an international transit exposition early in the decade? Unfortunately, the deemphasis on rail transit by the current Administration has forced a modified agenda. Beyond the technical and administrative issues, public transportation leaders will be looking for new approaches to strengthen the case for an enduring rail transit culture in the U.S.

The task is a challenging one, because the transit industry is operating in somewhat of a vacuum as to what, in fact, the national transportation policy is. Can we glean any insight from Transportation Secretary Drew Lewis's opening remarks at the May 1981 DOT International Symposium on Surface Transportation System Performance? He said, "We expect the costs of most transportation service to be met by the users. Our job is not to prop up inefficient systems through endless subsidies but to focus federal funds on those high payoff areas where wise capital investments will result in better performance."

One can't help but wonder how the Washington Metro funding application would have been received under this "policy." There are critics who claim (with very few well-founded arguments) that the system is too costly. Yet how many residents, or regular business travelers to the city, would be willing to live without the rail transit system? Those familiar with Washington will recall the automobile traffic congestion prior to the inauguration of service. It's difficult to imagine a more practical solution than a heavy rail system; yet, we have not seen any encouragement coming from the new Administration on new rail starts.

To be sure, the objectives of improved system efficiency, better performance, high payoff focus, and wise capital investments are most appropriate and certainly congruent with industry objectives. But one has to question the equity of burdening the transportation user with the full cost of the service, whether on an

Number of metros in operation or in construction 1980

	Operation	Construction	Design/ Planning
Argentina	1(1)		
Australia	1		
Austria	2(2)		
Belgium	1(1)		
Brazil	2(1)		
Bulgaria		1	
Canada	2(2)		
Chile	1(1)		
China	2(2)		
Czechoslovakia	1(1)		
Denmark	1		
Ecuador			1
Finland		1	
France	4(3)	1	
East Germany	1(1)		
West Germany	6(4)		
Greece	1		
Hong Kong	1(1)		
Hungary	2(1)		
India		1	
Iraq		1	
Ireland			1
Israel			1
Italy	2(2)	1	
Japan	9(5)		
Korea, Rep. of	1(1)		
Mexico	1		
Netherlands	2(1)		
Norway	1(1)		
Peru			1
Poland		1	
Portugal	1(1)		
Rumania	1		
Spain	3(1)	1	1
Sweden	1(1)		
Taiwan			1
Turkey			1
United Kingdom	3(6)		
United States	10(4)	3	2
U.S.S.R.	7(1)	4	3
Venezuela		1	
	71(7)	16	12

Footnotes:

[1] System(s) being expanded

[2] Only one of these systems is being expanded.

[3] Three systems are being expanded.

[4] Four systems are being expanded

[5] Eight systems are being expanded.

[6] Two systems are being expanded.

[7] Fifty-one systems are being expanded.

individual or broader regional basis. This is somewhat reminiscent of the childless couple's argument for exemption from school taxes.

The beneficiaries of rail transit include not only the direct users but non-users as well. What's wrong, for example, with having the diehard automobile commuter who is enjoying the reduced traffic congestion on a favorite freeway participate in the cost of the rail transit system that helped facilitate the continuation of an automotive addiction? The cost/benefit issues surrounding public transportation are enormously complex; the transit industry's leadership has been hard at work for some time developing well thought out policy recommendations which take into consideration the diverse implications. Any departure from a maturing rail transit policy should be made with no less forethought.

It appears that, for the immediate future, rail transit has become nothing more than a budget line item targeted for heavy pruning to achieve a general federal expenditure reduction. Who can argue that the drive to improve the general economic condition of the U.S. is not a matter of the utmost urgency? It is for just this reason that rail transit cannot be arbitrarily grouped with a host of questionable "Great Society" programs scheduled for budget reductions. On the contrary, rail transit must be given a high priority since sound and efficient transportation is at the very heart of any healthy society and economy.

Defusing the rail transit movement, which has been gathering momentum since the landmark 1964 mass transit legislation and the introduction of the highly successful Lindenwold line in 1969, will undoubtedly have some significant adverse long term economic impacts. Although the philosophical position that responsibility for mass transit resides at the local level may be sound, the practical realities are another matter. The financing structure for rail transit has evolved over a period of several decades; it involves a federal, state, and local funding partnership along with a substantial revenue component, unlike other public services, contributed by the users. That structure cannot be changed overnight on a unilateral basis without creating confusion, a deferral of important projects, and, ultimately, an increase in costs to the consumer once all the pieces are again aligned.

As the U.S. continues to sort out its priorities and perhaps draft a more meaningful public transit policy, the trend toward greater utilization of metropolitan railways—or metros—is unmistakable, certainly when viewed from an international perspective.

After a fairly constant rate of new construction—two systems every five years between 1907 and 1935—the pace of new projects stepped up sixfold after World War II into a trend of 12 new metros placed in operation every five years. This accelerated rate was motivated by the need to relieve the traffic congestion of inner cities—an important part of the fight against the twin enemies of air pollution and urban blight.

Even with reserved lanes for buses, it takes a high-speed, high-volume rapid transit system, operating on its own right-of-way, to take the strain off streets and freeways. It has been calculated that if the Bay Area Rapid Transit (BART) system, which carries 165,000 passengers a day, did not exist, 3,300 additional buses or 137,500 additional automobile trips would be required.

Cities around the world appear to have learned this lesson.

Of the 71 existing metro systems around the world, which now have 2,079 route miles in operation, 51 are expanding: they are constructing 475 additional route miles and have 995 more miles in the planning stages.

The eventual total length of these systems will be 3,538 miles. Sixteen new systems now under construction will total 270 miles. Twelve other systems totaling 155 miles are in the design or planning stages.

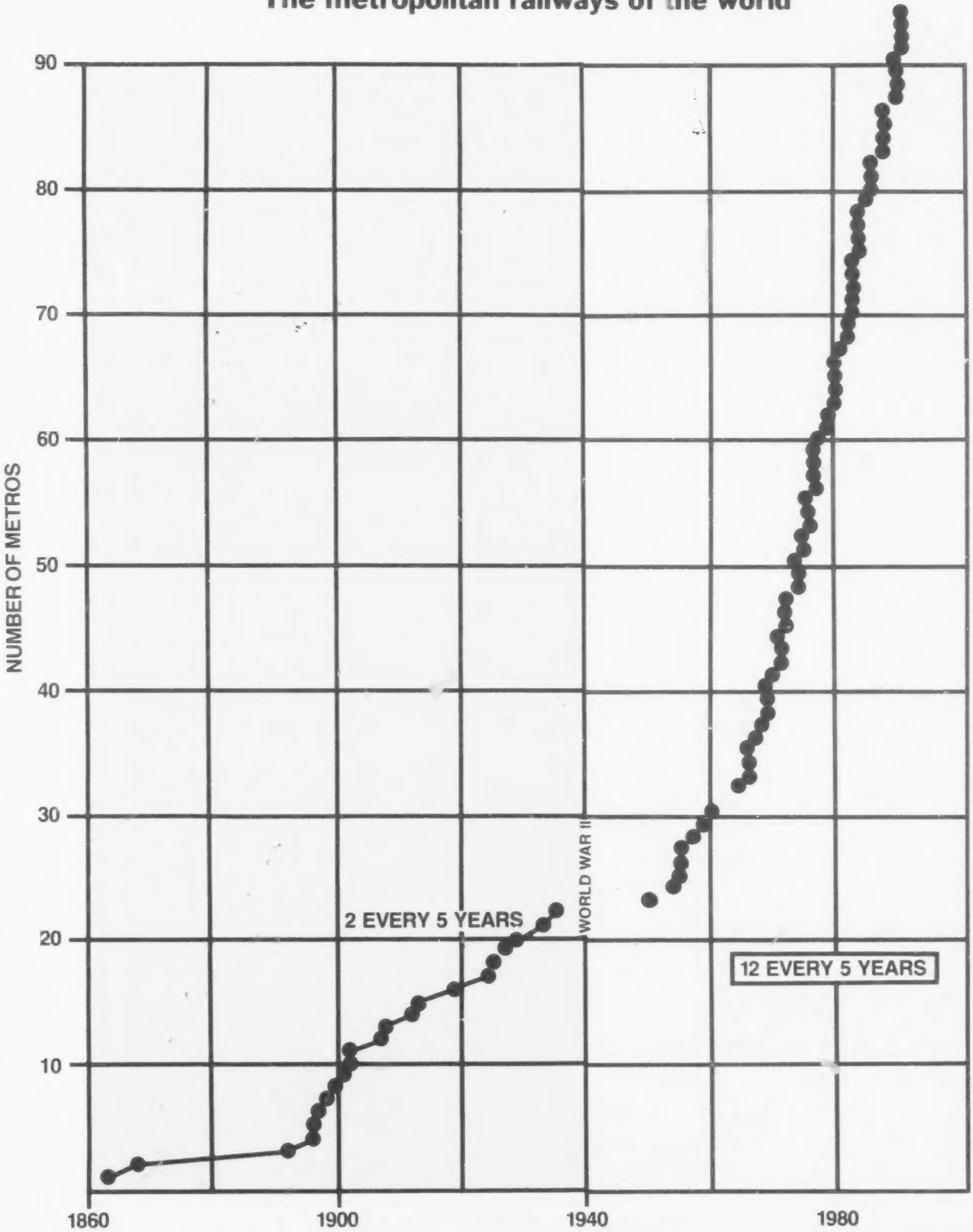
How big does a city or metropolitan area have to be to "qualify" for a metro? A population of 1 million has generally been regarded as a suitable threshold,

Metropolitan Railways: A chronology
Gate fold ▶

OVERSIZE FOLDOUT(S) FOUND HERE IN THE PRINTED EDITION OF THIS VOLUME ARE FOUND FOLLOWING THE LAST PAGE OF TEXT IN THIS MICROFICHE EDITION.

SEE FOLDOUT NO 1

The metropolitan railways of the world



but there are other important considerations.

Starting with Oslo in 1966, more than half of the urban areas building or planning metros have been in the 500,000 to 1.5 million population range. Eleven of these have less than 1 million population. They have been motivated by a number of reasons: enhancing the quality of urban life, improving accessibility to work, and, not least, bolstering the local economy, through both the employment generated by multi-million dollar construction efforts and the resulting spur to business and area development.

The escalating number of new metros throughout the world reflects the awareness that, starting from a certain stage of development, the large city becomes the victim of the pole of attraction that it constitutes. Thus, unless revitalized by the rapid transit lifeline, transportation will become a major problem, threatening the economic viability of central cities.

In the U.S., too, where in an entire century only six rail transit systems were placed in operation, there have been since 1972 six new systems inaugurated or placed under construction. Several more are planned.

Certain advantages of rail transit are obvious and well known: comfort, convenience, reliability, safety, high potential passenger capacity (between 40,000 and 70,000 riders per hour).

In addition to reduced door to door travel time, rapid transit offers other, less obvious benefits to the community. It has been demonstrated to be a major tool of controlled urban development. Retail sales soar in the immediate impact area (which is estimated at one square mile surrounding each station). Shopping malls spring up. There is a catalytic effect on major commercial or residential development. All of this inhances the quality of life.

There are, indeed, few city planners who would dispute that, even in an era of persistent budget deficits, money spent on rail transit would not pay off handsomely, stimulating the economy through higher productivity and increased retail sales. Their big question is: "Can we afford it?"

It is true that initial construction costs can be high, but operating costs are much less inflation sensitive. The cost of operating buses (and, of course, automobiles) is likely to escalate more rapidly, due both to increases in the price of fuel and to the labor intensive nature of the operations. There remains, of course, a need for the flexibility of the bus mode in low patronage applications.

In this era of energy consciousness, some foes of heavy rail transit thought that they had found a telling argument by "calculating" that the energy expended in the construction of a new rail system created an "energy debt" that would take up to 535 years of energy saving in operations to recoup. This is a distorted and misleading argument.

The San Francisco/Oakland BART system required 38.3 trillion Btu of energy for its construction, whereas the construction of a highway system as an alternative to BART would have required 79.6 trillion Btu.

As for traction, both heavy rail transit and buses use the same amount of primary energy per passenger mile—the equivalent, say, of 1/100th of a gallon, which is the same as getting 100 miles per gallon. (During crush hours, passenger miles per gallon grow to 540.) However, in the case of buses, we are talking real gallons and barrels of oil. Taking into account the indirect costs of purchases from overseas (loss of jobs in the U.S., effect on the balance of payments, inflation, the cost of insuring some immunity from interruptions through strategic reserves, etc.), the cost of a $36 imported barrel doubles to $72 as far as the U.S. economy is concerned. In the case of a metro, we are talking mainly of electric energy, obtained from hydro or nuclear power or coal, which has an equivalent "electric barrel" of oil cost as low as $16.

With bus energy costing up to two to four times as much as metro energy, on which side is the energy debt?

Life expectancy is another important consideration. Whereas most plants and machinery and other capital installations have life expectancies of 30 years or so, all metros that have ever been constructed—and some of them are now more than 100 years old—are not only still operating but are fulfilling a function which could not be matched by any substitute. Paris, which already had an extensive and highly serviceable 80-year-old metropolitan system, found it necessary to add, 12 years ago, a new regional express line (RER), which crosses the city from the eastern suburbs to the western suburbs, creating an artery which looked far into the next century for its reason of being. It had to be built 100 feet or more below surface, and its construction created major traffic tieups for several years—but these inconveniences have long been forgotten in the realization of the benefits the new system is bringing.

The economic value of metro transportation can hardly be overestimated. The scheduled speed for New York subway riders averages between 20 and 30 mph, compared with 6 to 8 mph speeds for the buses. For the more than 1 billion passengers who use the New York subways annually and for whom the average length of trip is nine miles, this represents, without counting frayed nerves, a total saving of 1 billion hours; even at the minimum wage, that translates into a saving of $3 billion a year to the economy of New York City.

The case for rail transit is a strong one. It cannot, in good conscience, fail to be recognized by an Administration dedicated to a return to sound business principles and to increased national productivity.

Global comparison of major metros

	Global Average	New York	Paris		Moscow	Tokyo	
			Metro	RER		TRTA	TBTMG
Average Passengers per car	40.9	38.3	28.8	45.3	54.5	72.3	45.3
Car Capacity	185	350	164	253	170	144	160
Average Occupancy as % of Capacity	27.4	11.0	17.6	17.9	32.0	50.2	28.3
Sq. ft per Passenger		2.1	2.3	3.0	3.1	4.0	3.4
KwHrs per Car Mile	5.90	5.84	4.46	6.40	3.97	3.77	4.92
Hours service is provided	–	24	20.25	20.25	19	19.50	19.50

Note: Of the 6 major systems shown in Table III, the New York subway is the only one which operates 24 hours every day. In fact, of all the other "metros" in the world, only the Chicago, Cleveland and Philadelphia systems also provide round-the-clock service. This is mentioned because it results in a lower average occupancy for the New York subway train than would be the case if operation was only provided 19 or [illegible] hours a day.

The metropolitan railways of the world: Statistical highlights

No.	Year of Initial Operation	City	Million Population	ROUTE MILES				Avge. Distance Betw. Stations	Speed MPH		Annual Million Passengers	Avge. Trip Length	Annual Million Passenger Miles	No. of Cars	Annual Million Car Miles	Avge. Passengers Per Car	Passenger Capacity Latest Cars		Car Floor Area, sq. ft	Annual Million kWh for Traction	kWh Per Car Mile	Power Supply	
				In Operation		In Construction	In Design Planning		Maximum Design	Avge. Commercial							Total	Seated				Voltage	3rd R. or Cat.
				Total	Above Ground																		
		NORTH AMERICA																					
		Canada																					
1.	1966	Montreal	2.7 (A)	25.7	(0.0)		5.1	0.56	43.5	22.4	142.1	4.10	582.9	735	33.5	17.4	160	40	441	251.9	7.52	750 V	2. G.B.
2.	1954	Toronto	2.1 (A)	32.8	(5.0)		0.9	0.47	52.2	18-23	204.4	4.29	875.7	632	37.7	23.2	319	76	732	326.0	8.65	600 V	3rd R.
		Mexico																					
3.	1969	Mexico City	13.0 (A)	28.8	(8.0)		22.4	0.54	50.0	21.6	837.5	4.72	3955.8	882	55.1	71.8	170	39	441	358.4	6.50	750 V	2. G.B.
		United States								30.0				120			275	65	753				
4.	1979	Atlanta	1.7 (A)	11.8	(5.0)	4.4	9.6	0.99	70.0	30.0	25 est.			72			154	74	687			750 V	3rd R.
5.	1982	Baltimore	2.5 (A)			8.0	5.6	1.00	70.0													700 V	3rd R.
6.	1897	Boston	2.8 (A)	34.2	(21.1)	6.4	9.1	0.68	44.7	17-24	95.0			339	11.1		239	64	639	66.0	5.95	600 V	3rd R.
7.	1984	Buffalo	1.3 (A)			6.9			55								200	60	608				
8.	1892	Chicago	6.7 (A)	89.0	(79.0)	7.5		0.62	55-70	24-28	150.7	5.1	769	1102	49.65	15.9	150	49	427	247.3	4.98	600 V	3rd R.
9.	1955	Cleveland	2.0 (A)	19.0	(18.7)			1.11	60.0	30.0	10.7			116	3.5		140	80	705	30.8	8.80	600 V	Cat.
10.	1990	Houston	2.4 (A)				11.0																
11.	1990	Los Angeles	9.5 (A)				18.0		80.0								150	72	813				
12.	1984	Miami	1.5 (A)			20.5		1.06	70					136			160	80	718				
13.	1868(A)	New York (NYCTA)	17.2 (A)	230.6	(93.6)			0.50	55.0	30-19	1054.2	9.0	9507	6424	248.5	38.3	350	76	715	1450.3	5.84	650 V	3rd R.
14.	1908	New York (PATH)	6.3 (A)	13.9	(6.0)		18.0	1.31	55	21.4	44.3	4.5	198	291	9.20	21.5	155	35	459	65.8	7.15	650 V	3rd R.
15.	1907	Philadelphia (SEPTA)	4.0 (A)	24.4	(8.6)		6.2	0.50	50	18-25	63.3	4.3/ 6.0	326	461	13.1	25.7	250/ 145	67/ 56	657/ 478	121.9	9.31	600 V	3rd R.
16.	1969	Philadelphia (PATCO)	4.0 (A)	14.5	(11.6)		32.6	1.21	74.6													800 V	3rd R.
17.	1972	San Francisco	3.1 (A)	71.5	(51.9)		53.1	2.30	80.0	43.5	44.6 (1978)	12.43	554.4	450	26.81	20.7	222	72	759	174.1	6.5	1000 V	3rd R.
18.	1976	Washington	3.1 (A)	33.7	(14.9)	28.0	38.3	0.93	75.0	35.0	59.2			300			232	68	721			750 V	3rd R.
		SOUTH AMERICA																					
		Argentina																					
19.	1913	Buenos Aires	8.9 (A)	21.1	(0.0)	6.3	34.1	0.37	43.5	11-16	207.0	2.5	528	414	14.2	36.5	167	47	585	54.8	3.86	550 V 1100 V 1500 V	3rd R. Cat. Cat.
		Brazil																					
20.	1977	Rio de Janeiro	9.0 (A)	3.2	(0.0)	10.0	29.2	0.62	62.2	28.0	7.0						368	44	656			750 V	3rd R.
21.	1974	Sao Paulo	12.4 (A)	12.4	(3.1)	15.7	27.8	0.56	62.1	18.6	197.7	4.35	860.0	228	14.2	60.7	330	62	646	79.1	5.6	750 V	3rd R.

(Continued)

The metropolitan railways of the world: Statistical highlights

				ROUTE MILES				Avge. Dis-tance	Speed MPH								Passenger Capacity Latest Cars					Power Supply	
				In Operation																			
No.	Year of Initial Opera-tion	City	Million Popu-lation	Total	Above Ground	In Con-struc-tion	In Design Plan-ning	Betw. Sta-tions	Maxi-mum Design	Avge. Com-mer-cial	Annual Million Passen-gers	Avge. Trip Length	Annual Million Passen-ger Miles	No. of Cars	Annual Million Car Miles	Avge. Pas-sen-gers Per Car	Total	Seated	Car Floor Area, sq. ft	Annual Million kWh for Trac-tion	kWh Per Car Mile	Vol-tage	3rd R. or Cat.
		Chile																					
22.	1975	Santiago	4.2 (A)	12.7	(4.1)	3.0	3.0	0.45	43.5	20.0	95.0	3.10	294.5	196			169	38	447	48.0		750 V	2. G.B.
		Ecuador																					
23.	1990	Quito	0.6 (A)				10.0	0.88	62.2					120			300	48	521				
		Peru																					
24.	1990	Lima-Callao	3.3 (A)				15.5	0.62	56.0	23.0							250	68					
		Venezuela																					
25.	1983	Caracas	2.2 (A)			12.3	9.3	0.60	50.0	21.1				242			240	57	638			750 V	3rd R.
		EUROPE Austria																					
26.	1898	Vienna (Stadtbahn)	2.0 (A)	12.8				0.62	24.9	15.2	54.4	3.4	183	310	11.62	15.8	100	20	274	16.0	1.38	750 V	Cat.
27.	1976	Vienna (U-Bahn)	2.0 (A)	7.9	(0.9)	8.2	2.5	0.58	50.0	22.0	34.0			212	1.49		140	49	533	16.4	11.0	750 V	3rd R.
		Belgium																					
28.	1976	Brussels	1.2 (A)	7.3	(1.9)	8.1	1.2	0.38	45.0	18.1	35.6			90	2.73		210	40	511	41.3	12.1	750 V	3rd R.
		Bulgaria																					
29.	1986	Sofia	1.1 (A)			4.7	64.9	0.78	50					125			220	42	533			600 V	3rd R.
		Czechoslovakia																					
30.	1974	Prague	1.2 (C)	7.0	(0.3)	5.0	33.8	0.53	56.0	20.5	207.4						162	42	516			750 V	3rd R.
		Denmark																					
31.	1935	Copenhagen	1.8 (A)	0.9			2.8		56.0		87.2			241			120	65	561				
		Finland																					
32.	1982	Helsinki	0.8 (A)			7.0	16.7	0.87	56.0	26.7				90			200	67	710			750 V	3rd R.
		France																					
33.	1983	Lille	1.0 (A)			7.9		0.50	50.0	21.7				152			80	22+ 12js	233			750 V	2. G.B.
34.	1978	Lyons	1.1 (A)	7.3	(0.0)	1.5	19.1	0.42	56.0	18.0	42.1	1.74	73.3	66	2.61	28.1	126	56	530	14.0	5.4	750 V	2. G.B.
35.	1977	Marseilles	1.0 (C)	5.6	(1.9)		5.6	0.50	50.0	20.5	26.5	2.36	62.6	63	2.42	25.9	120	48	436	18.0	7.4	750 V	2. G.B.
36.	1900	Paris (Metro)	8.6 (A)	117.2	(9.3)	5.3		0.34	43.5	14.7	1107.1	3.0	3372	3496	117.2	28.8	164	22 +24js	379	522.7	4.46	750 V	3rd R.
37.	1969	Paris (RER)	8.6 (A)	57.3	(40.7)	7.0		1.28/ 0.79	59-50	30-25	196.2	8.84	1341.3	506	29.6	45.3	253	78+ 40js	748	189.3	6.40	1500 V	Cat.

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No.	Year of Initial Operation	City	Million Population	ROUTE MILES				Avge. Distance Betw. Stations	Speed MPH		Annual Million Passengers	Avge. Trip Length	Annual Million Passenger Miles	No. of Cars	Annual Million Car Miles	Avge. Passengers Per Car	Passenger Capacity Latest Cars		Car Floor Area, sq. ft	Annual Million KWh for Traction	kWh Per Car Mile	Power Supply	
				In Operation		In Construction	In Design Planning		Maximum Design	Avge. Commercial							Total	Seated				Voltage	3rd R. or Cat.
				Total	Above Ground																		
		Germany Democratic Republic																					
38.	1902	East Berlin	1.6 (A)	10.0	(1.4)	4.0	22.7	0.48	43.5	15-20	75.0			340	6.96		110	33	288	17-28	2.4-4.0	750 V	3rd R.
		Germany Federal Republic																					
39.	1902	West Berlin	2.0 (C)	59.7	(10.9)	6.0	5.2	0.48	43.5	19.5	325.0	3.9	1252	914	41.6	30.1	197	38	427	155.3	3.73	750 V	3rd R.
40.	1968	Frankfurt	1.2 (A)	5.3		12.4		0.50	50.0	19.5	32.3	2.86	92.4	116			242	62	694				
41.	1912	Hamburg	2.5 (A)	55.6	(35.7)			0.66	43.5	19.6	180.2	3.3	594	849	31.6	18.8	364	92	1120	87.4	2.77	750 V	3rd R.
42.	1971	Munich	1.8 (A)	9.9	(1.8)	8.9	7.5	0.53	50	21	101.4	2.24	226.9	250	6.8	33.2	145	49	527	55.0	8.09	750 V	3rd R.
43.	1972	Nuremberg	0.8 (A)	5.8	(1.8)	2.1	5.9	0.45	50.0	20.0	25.0			64	6.21		145	49	566	61.0	9.8	750 V	3rd R.
44.	1901	Wuppertal	0.6 (A)	8.3	(8.3)			0.48	37.3	16.4	17.0	2.8	48	58	1.00	48.0	205	49	539	16.5	16.5	600 V	Guide Rail
		Greece																					
45.	1925	Athens	3.0 (A)	16.0	(14.2)		13.1	0.84	50	21.8	86.0	4.0	347	135	8.1	42.8	180	56	524	23.0	2.84	600 V	3rd R.
		Hungary																					
46.	1896	Budapest (Foldalatti)	2.4 (A)	2.5	(0.4)	0.5		0.25	37.3	11.8	21.0	2.1	44	23	1.37	32.1	171	48	689	21.0	15.3	550 V	Cat.
47.	1970	Budapest (Metro)	2.4 (A)	9.2	(0.8)	9.9	33.6	0.62	50.0	21	270.6	2.17	586.3	175	11.4	51.6	171	48	689	62.4	5.47	825 V	3rd R.
		Ireland																					
48.	1990	Dublin	1.0 (A)					44.1				4.10		100			136	42	377				
		Italy																					
49.	1964	Milan	3.9 (A)	27.0	(8.4)	3.2	9.3	0.42	53.1	17-21	190.7	3.06	583.5	354	13.8	42.3	218	36	500	83.9	6.08	750 V 1500 V	3rd R. Cat.
50.	1986	Naples	3.4 (A)			6.9	9.3	0.49	50										515			1500 V	Cat.
51.	1955	Rome	3.6 (A)	15.6	(3.7)			0.68/ 0.42	62.1/ 49.7	23.2/ 20.5	35.7	3.92	139.8	208	2.5	54.8	202	32	499	22.5	9.00	1500 V	Cat.
		Netherlands																					
52.	1977	Amsterdam	0.7 (A)	[illegible].0	(7.8)	2.5		0.56	43.5	20-22	16.0	2.92	46.7	74	1.86	25.1	150	50	581	19.3	10.4	750 V	3rd R.
53.	1968	Rotterdam	0.8 (A)	10.6	(8.6)	7.5		0.94	50.0	20.0	36.5	3.48	127.0	142	3.9	32.4	119	40	371	23.3	5.97	750 V	3rd R.
		Norway																					
54.	1966	Oslo	0.5 (C)	22.1	(15.4)	0.9		0.51	43.5	20.0	37.0	4.23	156.4	162	6.2	25.4	168	62	571	43.0	6.94	750 V	3rd R.
		Poland																					
55.	1988	Warsaw	1.3 (A)			15.2	65.6	0.66	56								170	44	523				
		Portugal																					
56.	1959	Lisbon	2.3 (A)	7.5	(0.0)	3.1	12.5	0.39	37.3	17.4	111.7	1.99	222.3	80	4.2	52.6	200	36	463	31.0	7.35	750 V	3rd R.

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No.	Year of Initial Operation	City	Million Population	ROUTE MILES				Avge. Distance Betw. Stations	Speed MPH		Annual Million Passengers	Avge. Trip Length	Annual Million Passenger Miles	No. of Cars	Annual Million Car Miles	Avge. Passengers Per Car	Passenger Capacity Latest Cars		Car Floor Area, sq. ft	Annual Million kWh for Traction	KWh Per Car Mile	Power Supply	
				In Operation		In Construction	In Design Planning		Maximum Design	Avge. Commercial							Total	Seated				Voltage	3rd R. or Cat.
				Total	Above Ground																		
		Rumania																					
57.	1979	Bucharest	1.6 (A)	5.0	(0.0)		23.0	1.00	56.0	25.0				80			260	42	513			750 V	3rd R.
		Spain																					
58.	1924	Barcelona-Metropolitano	2.9 (A)	30.0	(0.6)	7.1	28.2	0.43	37.3	14-17	243.0	3.0	729	412	19.3	37.8	236	36	466	103.1	5.34	1500 V 1300 V	3rd R. Cat.
59.	1929	Barcelona-Sarria	2.9 (A)	4.8	(1.7)	0.6		0.40	37.3	18.6	28.8	0.9	27	34	1.2	22.5	116	56	534	11.5	9.58	1200 V	Cat.
60.	1983	Bilbao	0.9 (A)				11.2	0.66	50.0	23.0							200		542				
61.	1919	Madrid	3.5 (A)	46.0	(3.4)	3.6		0.34	40-50	14-19	394.0	3.2	1261	763	44.1	28.6	236	40	518	199.4	4.52	600 V	Cat.
62.	1983	Seville	0.9 (A)			6.5	10.3	0.44		21.8				112			200		472			1500 V	Cat.
		Sweden																					
63.	1950	Stockholm	1.5 (A)	64.4	(29.2)	3.9	3.9	0.62	56.0	20-25	189.0	4.23	798.8	885	39.8	20.1	156	48	561	206.0	5.18	650 V 750 V	3rd R. 3rd R.
		United Kingdom																					
64.	1896	Glasgow	2.5 (A)	6.5				0.44	33.6	18.0	10.0	1.9	19	33	0.65	29.2	90	36	304	4.1	6.30	600 V	3rd R.
65.	1863	London	7.0 (A)	254.0	(151.0)	3.5		0.81	68.4	20.4	594.0	4.7	2769	3994	202.0	13.7	232	48	551	618.0	3.06	600 V	3rd R.
66.	1980	Newcastle	1.3 (A)	11.7	(10.8)	21.8		0.90	50.0	28.0				58			210	84	742			1500 V	Cat.
		USSR																					
67.	1967	Baku	1.5 (C)	11.6	(1.1)	4.2	7.3	1.12	56.0	28.6	138.9	3.98	552.5	108	7.95	69.5	170	44	523	46.8	5.89	825 V	3rd R.
68.	1988	Dnepropetrovsk	1.1 (C)				8.1															825 V	3rd R.
69.	1984	Gorki	1.3 (C)			6.0	10.4	0.85														825 V	3rd R.
70.	1975	Kharkov	1.4 (C)	10.8	(0.0)	6.8	7.8	0.89	56.0	30.0	164.0	3.36	550.4	176	13.11	42.0	170	44	522	69.7	5.3	825 V	3rd R.
71.	1960	Kiev	2.1 (C)	13.5	(3.6)	8.2	7.6	0.80	56.0	28.0	242.3	4.72	1144.5	279	18.6	61.5	170	44	516	83.4	4.48	825 V	3rd R.
72.	1990	Kubyshev	1.2 (C)				10.9															825 V	3rd R.
73.	1955	Leningrad	4.6 (C)	38.4	(0.4)	6.7	14.4	1.09	56.0	28.9	678.6	5.22	3542.7	937	77.8	45.5	170	44	521	319.1	4.10	825 V	3rd R.
74.	1983	Minsk	1.3 (C)			5.3	8.3	0.67	56								170	44	522				
75.	1935	Moscow	8.0 (C)	114.4	(11.2)	14.7	16.8	1.14	56.0	30.0	2266.2	6.09	13802.7	2675	253.3	54.4	170	44	522	1005.8	3.97	825 V	3rd R.
76.	1985	Novosibirsk	1.3 (C)			8.0	6.0	0.89	56								170	44	522			825 V	3rd R.
77.	1990	Riga	0.8 (C)				12.4																
78.	1977	Tashkent	1.7 (C)	7.0	(0.0)	2.5	5.3	0.88	56.0	29.3	58.7	3.42	200.7	75	4.85	41.4	170	44	522	32.0	6.6	825 V	3rd R.
79.	1966	Tbilisi	1.1 (C)	11.7	(1.5)	5.0		0.78	56.0	28.5	126.4	3.11	392.8	105	8.1	48.6	170	44	523	47.0	5.80	825 V	3rd R.
80.	1981	Yerevan	1.0 (C)			7.1		0.89														825 V	3rd R.

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No.	Year of Initial Opera-tion	City	Million Popu-lation	ROUTE MILES.				Avge. Dis-tance Betw. Sta-tions	Speed MPH		Annual Million Passen-gers	Avge. Trip Length	Annual Million Passen-ger Miles	No. of Cars	Annual Million Car Miles	Avge. Pas-sen-gers Per Car	Passenger Capacity Latest Cars		Car Floor Area, sq. ft	Annual Million kWh for Trac-tion	kWh Per Car Mile	Power Supply	
				In Operation		In Con-struc-tion	In Design Plan-ning		Maxi-mum Design	Avge. Com-mer-cial							Total	Seated				Vol-tage	3rd R. or Cat.
				Total	Above Ground																		
		MIDDLE EAST																					
		Iraq																					
81.	1986	Baghdad	2.9 (A)			7.5	18.6			22.4				186			145	49	527				
		Israel																					
82.	1990	Tel-Aviv-Jaffa	0.9 (A)				37.3	0.39	56-0					130			250	80					
		Turkey																					
83.	1988	Ankara	2.8 (A)				7.1	0.39	50	22.4				130			155	45	398				
		ASIA																					
		China																					
84.	1971	Peking	8.0 (A)	14.7	(0.0)	10.0	8.0	0.92	43.5	23.6	35.0			64			185	60	560			750 V	3rd R.
85.	1980	Tianjen	3.0 (C)	3.1	(0.0)		4.4	0.62	43.5													-	3rd R.
		Taiwan																					
86.	1988	Taipei	5.0 (A)				13.25																
		Hong Kong																					
87.	1979	Hong Kong	4.7 (A)	9.7	(3.8)		6.7	0.69	50.0	20.0	14			210			375	48	710			1500 V	Cat.
		India																					
88.	1985	Calcutta	9.0 (A)			10.2		0.64	50	18.6				72			300	46	549			675 V	3rd R.
		Japan																					
89.	1979	Fukuoka	1.0 (C)	9.2	(0.0)				56.0	25.5						-	145	-	527			600 V	Cat.
90.	1977	Kobe	1.4 (C)	3.6	(1.7)	5.0		1.18	62.2	26.7	13.0			24	1.68		142	56	545			1500 V	Cat.
91.	1981	Kyoto	1.5 (C)	4.3	(0.0)	3.2	20.5	0.61	46.6	20.5							130	52	543			1500 V	Cat.
92.	1957	Nagoya	7.3 (A)	32.1	(4.4)	3.7	1.9	0.62	46.6	21.1	264.0	3.23	852.7	420	20.5	41.6	135	51	563	113.8	5.55	600 V	3rd R.
93.	1933	Osaka	8.3 (A)	47.0	(6.5)	8.4	3.1	0.62	43.5	19-21	766.8	2.67	2049.2	770	39.4	52.0	140	48	561	181.3	4.60	1500 V 750 V	Cat. 3rd R.
94.	1971	Sapporo	1.3 (C)	15.0	(2.9)	4.7	10.0	0.62	43.5	20-24	171.6 (1976)			248	8.33		121	48	570	33.3	4.0	1500 V 750 V	Cat. 3rd R.
95.	1927	Tokyo (TPTA)	24.3 (A)	81.4	(13.7)	2.1	29.5	0.68	34-62	15-28	1561.0	4.5	6985	1595	96.6	72.3	144	54	581	363.7	3.77	1500 V 600 V	Cat. 3rd R.
96.	1960	Tokyo (TBTMG)	24.3 (A)	34.1	(3.9)	4.5	24.2	0.60	46.6	19.2	301.0	3.80	1141.1	440	25.2	45.3	160	54	536	124.1	4.92	1500 V 1500 V	Cat. Cat.
97.	1972	Yokohama	2.6 (C)	7.1	(0.0)	5.3	31.3	0.71	56.0								145	52	538			750 V	3rd R.
		Korea Republic																					
98.	1974	Seoul	7.9 (A)	5.9	(0.0)	8.7	21.8	0.61	50.0	21.8	255.5											1500 V	Cat.
		Australia																					
99.	1926	Sydney	3.0 (A)	5.7	1.7			1.36	37-62		177			191	9.4		248	114	749				

(A) Area Population (C) City Limit Population

Market

CARLOADINGS

Loadings of revenue freight in the week ended Sept. 5 totaled 450,161 cars, according to the Association of American Railroads. This was an increase of 62,459 cars, or 16.1%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Sept. 5 are estimated at 19.4 billion, an increase of 21.1% above the corresponding week of 1980. The 1980 week included the Labor Day holiday.

REVENUE FREIGHT CARLOADINGS

Commodity	**Sept. 5 week**	**Aug. 29 week**
Grain	29,102	27,208
Other farm products	2,705	3,125
Metallic ores	36,376	36,190
Coal	135,197	139,877
Crushed stone, gravel & sand	12,422	13,012
Nonmetallic minerals	12,706	13,611
Grain mill products	13,982	14,218
Food & kindred products	15,896	15,843
Primary forest products	17,301	18,938
Lumber & wood products (except furniture)	6,961	7,585
Pulp, paper & allied products	19,868	19,327
Chemicals & allied products	26,420	26,393
Petroleum products	5,295	5,338
Stone, clay & glass products	13,572	13,280
Coke	6,750	6,935
Metals & products	16,236	15,506
Motor vehicles & equipment	12,797	12,945
Waste & scrap materials	11,817	11,832
Forwarder & shipper assn. traffic	10,022	10,040
All other carloads	44,517	45,154
LCL traffic	219	256
Total cars loaded	**450,161**	**456,613**
Cumulative total	1981	1980
36 weeks	**15,066,511**	**15,588,303**
Estimated revenue ton-miles (billions) 36 weeks	**639.1**	**629.1**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Aug. 29 totaled 34,576 cars (3.7% above the corresponding 1980 week) and 64,417 trailers or containers (up 5.3% from 1980). Cumulative volume for the first 35 weeks of 1981 is 1,135,382 (up 1.4% from 1980) and 2,052,275 trailers or containers (up 0.6% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Aug. 14 totaled 4.4 million tons (down 11.4% from 1980). Cars loaded totaled 61,733 (down 12.8% from 1980). Cumulative loadings for 1981 were up to 158.8 million tons (down 3.1% from 1980).

- *Conrail.*—An $8.6-million upgrading of 47½ miles of line between Kankakee and Streator, Ill., calls for installation of cwr, surfacing, improvement of 17 switches, and resurfacing of 64 grade crossings.

- *Chattahoochee Industrial Railroad.*—Is leasing 200 new 70-ton boxcars, valued at $9 million, from the Railcar Division of Evans Products Co.'s Transportation Systems and Industrial Group. The cars will be assigned primarily to CIRR's largest on-line customer, Great Southern Paper Co.

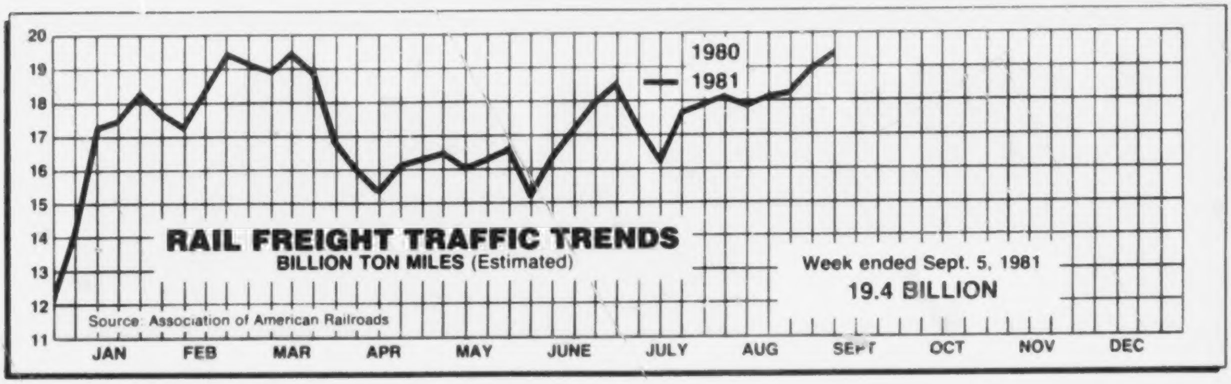
- *Iraq Republic Railway Organization.*—Placed a $17.5-million order with the Rail and Diesel Products Division of Bombardier for the supply of spare parts for Bombardier-built diesel-electrics.

- *Niagara Frontier Transportation Authority.*—The 33 light rail vehicles that Tokyu Car of Yokohama is building for NFTA's Buffalo, N.Y., system will have propulsion controls, motors, and gear units supplied by Westinghouse Electric, according to a letter of intent awarded by Mitsui and Company USA, agents for the Japanese firm. The chopper control propulsion systems will utilize fourth generation Westinghouse microprocessor technology.

- *Portland Tri-county Metropolitan Transportation District.*—Awarded a $25-million (Canadian) contract to Bombardier, Inc. to supply 26 six-axle, articulated, double-end light rail cars (*RA*, Aug. 10, p. 32).

- *Southern California Rapid Transit District.*—Has selected Booz Allen & Hamilton to provide systems engineering and analysis support during the preliminary engineering phase of SCRTD's proposed Metro Rail Project.

- *Washington Metropolitan Area Transit Authority.*—General Railway Signal is the apparent low bidder, at $3.9 million, for supply and installation of a signal and control system at Shady Grove Yard, which will be located at the end of WMATA's Red Line in Maryland. GRS President Gerald E. Collins said equipment production is to begin at Rochester, N.Y., later this year; the project is due for completion in August 1983.



The metropolitan railways of the world: A chronology

Scope of analysis

The metro systems included in the graphs and tables accompanying this article are defined as inner-city, mass-transit systems, including light rail, operated on dedicated tracks that serve metropolitan centers and, in many cases, extend into the suburbs. Commuter train systems that serve metropolitan centers operated on tracks of main-line railroads are not included. This information has been developed primarily from the 1980 Yearbook, "Metropolitan Railways of the World," prepared by the *Direction des Etudes Generales* of the Paris Transportation Authority (RATP), with the assistance of the public authorities that are members of the International Metropolitan Railways Committee. The 1979 edition of the International Union of Public Transport's "Handbook of Urban Transport" was also used. Information was updated by direct contacts with numerous transit authorities.

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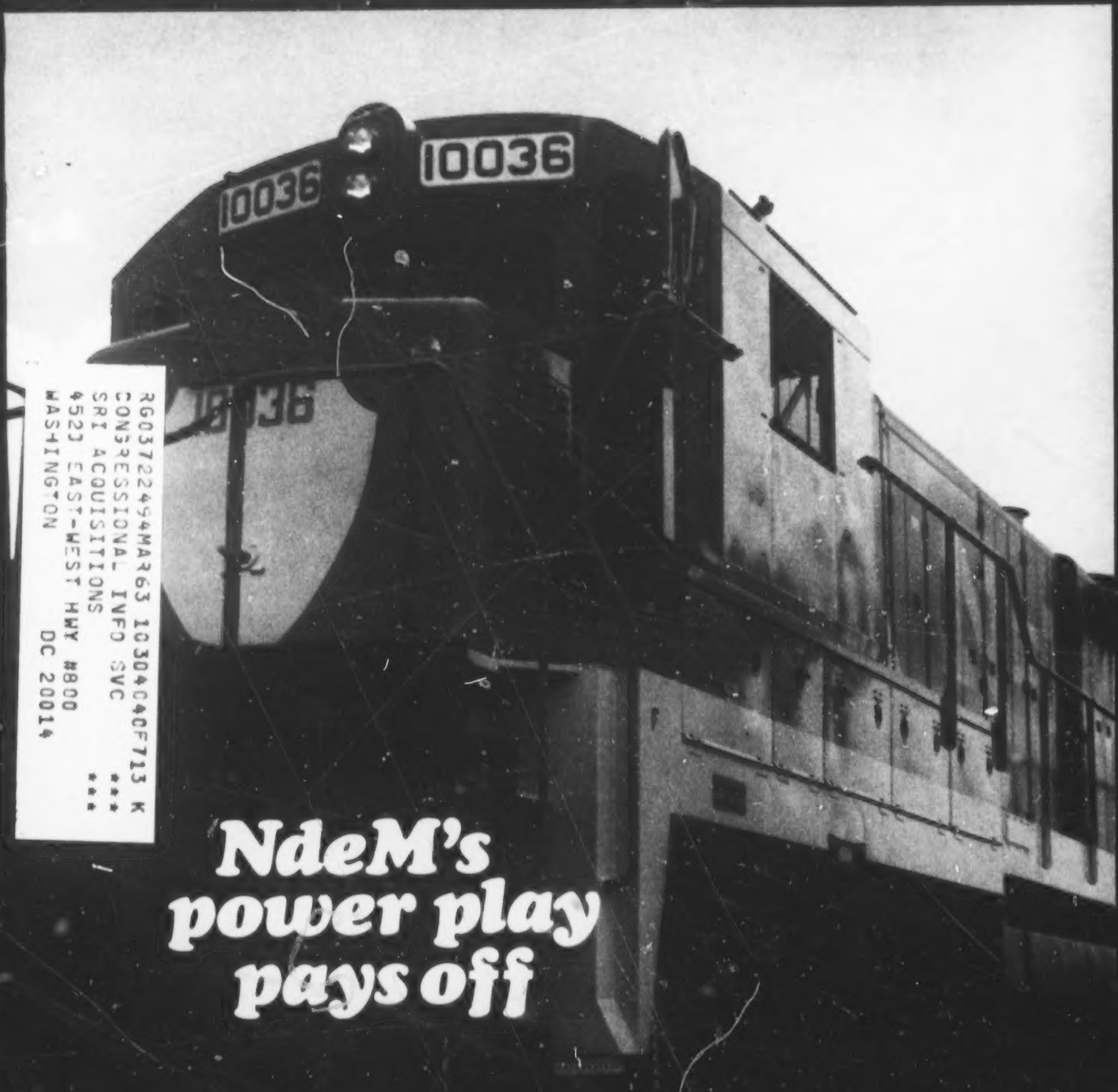
Amtrak: Two big strides on the road to modernization

October 12, 1981

RAILWAY AGE



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NdeM's power play pays off

RAILWAY AGE
October 12, 1981

FEATURES

RAILWAY AGE
NdeM's power play pays off

Cover article, page 14

14 NdeM's power play pays off
With a great assist from its Aguascalientes shop, where GE locomotives are being assembled from kits, Mexico's biggest railroad is overcoming a power shortage that at times has all but closed down some critical lines.

22 Amtrak narrows the generation gap
Late in September the first of a second generation of Amfleet cars began to come out of Budd's Red Lion plant. When delivery of the 150 cars is completed, Amtrak will have a fleet of nearly 1,600 new or good-as-new cars.

28 "Something to show the world"
On September 25, Amtrak dedicated its newly-renovated Chicago maintenance base. A total of $44 million was spent on the facility, whose structures, scattered along 12 miles of track, have 370,000 square feet of space.

32 Operation Lifesaver lives up to its name
Started by Union Pacific 10 years ago, the program has become nation-wide in scope and has played a major rule in reducing grade-crossing casualties. Here, UP's Ed Schafer gives some pointers on how it can best be used.

33 What rail deregulation means to the grain industry
Among options that may soon open up, says AAR's Richard E. Briggs, is containerized grain: "This may sound like a pipedream today, but today's pipedream is tomorrow's reality in the deregulated transportation atmosphere."

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COVER: NdeM locomotive assembled at Aguascalientes from a GE kit.

recognition of the prestige of our training institute has crossed our borders. It is not unusual to see groups of students coming from foreign railroads."

Other foreigners recognizing the quality of NdeM training are representatives of General Electric involved with locomotive assembly at Aguascalientes. "They're excellent workmen," says Earl Hanson, GE's manager for export sales of locomotive components. "They take a great deal of pride in their work." About 50 NdeM-trained Mexicans form the crew at Aguascalientes. Also there full-time is Edward G. Bricker, GE project manager, who formerly was locomotive-assembly superintendent at Erie. In addition, there are four roving GE service engineers.

"Those locomotives are the pride of their fleet," Hanson says. "They watch them all the time to avoid even the slightest problem."

- **Shop improvement.** Though their skills have improved, NdeM shop employees still need better tools. Manual operations have been the norm, although that is changing. "Of course," says Harfuch, "there are plans for improving our shops, both for locomotives and for cars. Among our priorities are cleanliness, testing, productivity, and mechanization, and we are proceeding to acquire equipment, machinery, and tools to achieve those objectives. The estimated investments for strengthening our facilities are 550 to 650 million pesos [$25 million-$28-million] each year for at least five years." NdeM's 1981 budget included about $17 million for shop improvement.

The shop at San Luis Potosi will handle all heavy repairs of locomotives, while Aguascalientes does the big work on cars, besides assembling locomotives. The number of other repair points is being reduced to about 25 from 32. "Diesel locomotive maintenance has simply been carried out at too many places," Harfuch says.

- **A better car fleet, too.** Though NdeM's most dramatic equipment improvement has come in motive power, the freight car fleet is showing significant gains as well. This year alone, about 3,700 new cars are going into service, at a total cost of about $217 million. The bulk of this new equipment is coming from Mexico's own carbuilder, Constructora Nacional de Carros de Ferrocarril, S.A. Keeping costs down by concentrating on basic units such as boxcars, gondolas, and hoppers, Constructora has been successful in bidding against foreign competitors. (World Bank loan terms require international bidding.)

That leaves a good market for builders of specialty cars. One major supplier has been Portec, whose 1981 deliveries include 60 piggyback flatcars, 150 rotary dump gondolas, 120 bulkhead flat cars, and 150 side-dump ballast cars (*RA*, Aug. 31, p. 10.) Also this year, Portec produced 100 bulkhead flats for one of the smaller roads, and 20 side-dump cars for Mexico's Secretariat of Communications and Transportation (SCT), which is responsible for building new track and yards.

Fruit Growers Express is another U.S. carbuilder with a growing role in NdeM improvement, especially as a supplier of cabooses. This year alone, NdeM has received 152 FGE radio-equipped units with cupolas offering visibility for mountain routes. Other suppliers include: Multi-Systems International, 100 ballast hopper cars and 25 piggyback flatcars; Hawker Siddeley, 95 ballast hopper cars; Mecano Export-Import of Rumania, 44 rotary-dump hopper cars.

- **Bold plans for 1982-85.** Such builders are likely to stay busy for some time, as NdeM carries out bold plans for acquiring new rolling stock through 1985. Outlays for 1982 through 1985 just for new freight cars are programmed at nearly $800 million, according to Ing. Alfonso Hernandez Lozano, assistant manager-planning and organization. Including this year's program, NdeM will have acquired approximately 16,600 new freight cars by the end of 1985.

NdeM's total 1981-85 program will cost about $1.7 billion. That doesn't include new track, which is part of the Secretariat's 1981-85 program involving expenditure of at least another $1.5 billion. SCT's plans include 514 miles of new double track, 356 miles of main-line electrification, and four new major classification yards, among other things.

Also part of the combined $3.2-billion NdeM/SCT program for 1981-85 are: 961 miles of new rail, 1,240 miles of new centralized traffic control, 850 new or reinforced bridges and culverts, and full installation of a computerized system for information and yard control.

- **"We are railroaders."** These projects are part of Gomez Z.'s version of the railways as the backbone of Mexico's transportation system. He is impatient with people who don't share his enthusiasm. Among those people are certain Mexican journalists who seem to think that the long-neglected rail system can be transformed overnight. In the September issue of *Ferronales*, NdeM's magazine, Gomez Z. wrote:

"We're not going to be bothered by talk and rumors. We will rely on what we are and what we've accomplished. We are railroaders, with dedication and proven patriotism. That is something we have shown with deeds, not with words. We are assembling locomotives, we are reducing curves and grades, we are building a communication system. We are showing the President that what he entrusted to us is in very good hands. The same man who directs the destiny of our country knows full well our daily struggle and the efforts we are making to constantly improve our service." ■

Latin America's railways

The XV Pan American Railway Congress, which meets in Mexico City Oct. 25-Nov. 2, will focus the attention of the railway world on the continuing struggle of Latin American countries to modernize rail systems that in many instances are suffering from half a century or more of neglect. Progress is most visible in the host country, Mexico, which is investing billions of petropesos in a sweeping program of railway rehabilitation. But there is also considerable activity elsewhere:

—Brazil is giving top priority to three major programs: completion of a new steel line (of which a 227-mile priority section should be in operation in September 1983); construction of new lines for the coal industry; and expansion and improvement of seven urban rail systems. Steel-line construction alone will cost an estimated $1 billion. Meanwhile, the former Sao Paulo Railway (FEPASA), now part of the national system, is moving towards further electrification. A $300-million contract for the first phase of electrification in the Uberabas-Santas export corridor has gone to a European group led by Francorail-MTE.

—Argentina has begun work on the $433-million electrification of the suburban Roca line serving Buenos Aires; contracts have gone to a Japanese consortium led by Marubeni Corp. and including Toshiba, Mitsubishi Electric and Hitachi.

—Electrification of Ecuador's railway is now the subject of feasibility studies by firms from Italy and Hungary.

—Bolivia is still pondering a solution to what remains the country's most pressing railway problem: linking the Andean and eastern networks. The cost could be close to $1 billion.

—In Chile, a strictly commercial approach to railroad operation has cut the labor force to about 10,000, compared with 25,000 in 1974. Many losing lines have been closed. The Chilean government has ended all subsidies to the railroad, which was turned over to a new company, Corfo, in 1979.

—In Paraguay, some track improvements are being made in anticipation of government approval for an overall modernization program that would include electrification of the President Carlos Antonio Lopez Railway. Bids have been submitted by a number of international groups.

Country	Length (miles)	Gauge	Freight cars	Locomotive-hauled passenger cars	Self-propelled passenger cars	Locomotives
Argentina						
Argentine Rys. (FA)	23.943	5'6"; 4'8½" 3'3⅜"	66.125	4.342	1.388	1.422 steam 1.196 diesel
Bolivia						
Guaqui-La Paz Ry	65	3'3⅜"	139	1		2 steam 1 electric
Bolivian National Rys. (ENFE)	2.177	3'3⅜"	2.151	187	47	63 diesel
Brazil						
Federal Rys. of Brazil (RFFSA) (includes FEPASA)	17.370	3'3⅜"; 5'3"; 2'6"	60.034	2.268	462	1.857 diesel 103 electric 44 steam
Vitoria a Minas Ry. (EFVM)	469	3'3⅜"	11.501	49	47	202 diesel
Chile						
Arica-La Paz Ry	135	3'3⅜"	476	97	4	12 diesel
Iquique-Pueblo Hundido Ry	782	4'8½" 3'3⅜"	1.160	26		38 steam 10 diesel
Chilean State Rys. (EFE)	4.771	5'6" 3'3⅜"	9.856	804	76	231 diesel 438 steam
Antofagasta & Bolivia Ry.Co. (FCAB)	434	3'3⅜"	2.600	92		22 diesel 4 steam
Colombia						
National RRs. of Colombia (FNC)	2.041	3'	5.399	215	15	6 steam 169 diesel
Costa Rica						
Costa Rica RR (FECOSA)	585	3'6"	2.275	120	63	14 electric 90 diesel
Cuba						
Cuban Rys. (FEC)	3.141	4'8½"; 3'	—	—	—	170 diesel
Dominican Republic						
Central Romana RR	235	4'8½"	950			15 diesel
Ecuador						
Ecuadorean State Rys. (ENFE)	1.538	3'6"	400	50	52	24 diesel 31 steam
El Salvador						
National Rys. of El Salvador (FENADESAL)	374	3'	599	59	43	20 diesel 4 steam
Guatemala						
Guatemala Rys. (FEGUA)	512	3'	1,500	80	17	26 diesel
Honduras						
Honduras National Ry. (FNH)	608	3'6"; 3'	2,700	265		57 diesel 12 steam
Jamaica						
Alpart Ry.	10.8	4'8½"	343	—	—	5 diesel
Kaiser Jamaican Bauxite Co.	15	4'8½"	88	—	—	4 diesel
Jamaican Ry. Corp. (JRC)	205	4'8½"	266	35	6	31 diesel
Mexico						
Southeast United Rys. (FUS)	1,384	4'8½"; 3'	834	59		31 diesel
National Rys. of Mexico (NdeM)	12,659	4'8½"	32.843	1,048	39	1,084 diesel
Chihuahua Pacific Ry. Co. (CHP)	942	4'8½"	1,782	48	14	44 diesel
Pacific RR (FCP)	2,310	4'8½"	5.524	168	—	169 diesel
Sonora Baja California Ry. (SBC)	379	4'8½"	309	39		19 diesel
Nicaragua						
Ry. of Nicaragua	232	3'6"	129	1	8	12 diesel
Panama						
Panama RR (FLP)	47	5'	358	24		6 diesel
National Ry. of Chiriqui	76	3'	24	5	4	5 diesel
Chiriqui Land Co., Armuelles & Bocas	228	3'	975		—	33 diesel
Paraguay*						
President Carlos Antonio Lopez Ry. (FPCAL)	265	4'8½"	147	9	—	21 steam
Peru						
Southern Peru Copper Corp.	177	4'8½"	233	—		8 diesel
Mining Co. of Central Peru	127	4'8½"	689	13	—	12 diesel 2 steam
Peruvian National Rys. (ENAFER)	997	4'8½"; 3'	2.101	175	37	84 diesel 24 steam
Uruguay						
Uruguayan State Rys. (AFE)	1.803	4'8½"	2.893	94	45	110 diesel 17 steam
Venezuela						
Orinoco RR	143	4'8½"	1.485			36 diesel
Venezuelan National Rys. (FNV)	138	4'8½"	284	21		12 diesel

Operation Lifesaver lives up to its name

If you lay out the numbers side by side, the problem of accidents at rail/highway grade crossings is a small one, compared with the overall problem of motor-vehicle accidents.

Tens of thousands of people are killed each year in motor-vehicle accidents. Last year, and in four of the past six years, the number of people killed in accidents at public crossings has been below 1,000. In 1980, the number of fatalities at both public and private crossings was 833, and 85 of those deaths did not involve the collision of a train and a motor vehicle. Since 1976, the number of persons injured and the total number of casualties have been dropping. The number of accidents last year was the lowest since reporting requirements were changed in 1975.

And yet, the population has been going up, the number of licensed drivers has been going up, the number of motor vehicles on the road has been going up. Rail traffic, in a number of areas, has been going up.

What accounts for the improvement in the numbers? Some of it, without a doubt, comes from construction of new grade separations and from the installation of more crossing-protection devices, gates, lights, bells.

Some of it, without a doubt, also comes because of Operation Lifesaver.

But, with grade-crossing accidents accounting for such a tiny percentage of total motor-vehicle deaths, why all the attention paid to crossing-accident prevention? Why an Operation Lifesaver?

● **Railroad's biggest hazard.** For one thing, while crossing deaths may be a "tiny percentage" of all motor-vehicle fatalities, crossing accidents account for close to 60% of the fatalities associated with railroads.

For another, the chances of a motorist getting killed in a crossing accident are a lot higher than they are in the case of your average highway accident. Trains, as Operation Lifesaver keeps trying to point out, are a lot bigger and they are harder to stop than automobiles and trucks.

For a third, while dedicated do-gooders may tsk-tsk at such a thought, effective public safety programs are good public relations: A railroad putting its money and its people out there campaigning to save lives has got to reap certain benefits for its image, and anybody who decries this is simply being unworldly.

What is Lifesaver? It's a program that began in 1972 in Idaho, a program that has since been extended into 28 other states. It's a program that was started by one railroad, Union Pacific, a program that most of the industry has now become involved in. It's a program that has gone national, in the sense that the National Safety Council and the Federal Railroad Administration have become involved, but it's still a program that is state-oriented, not really national-in-scope.

● **Following the four E's.** Several observations might be made about Operation Lifesaver, as it heads toward its 10th anniversary:

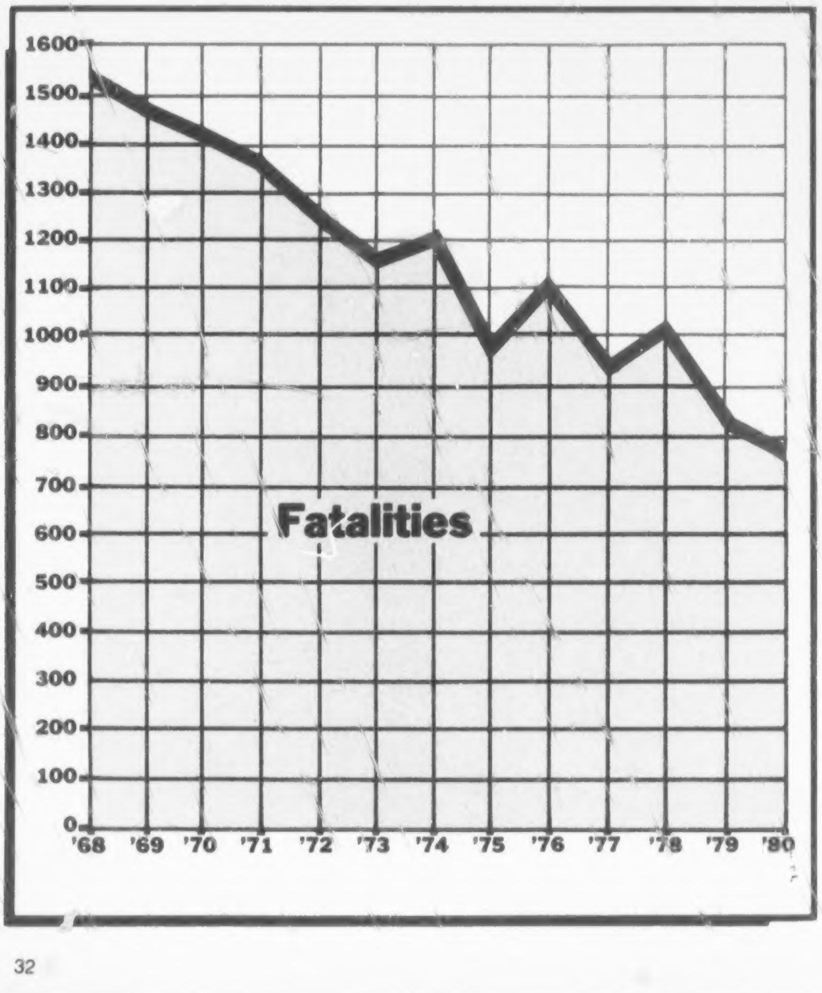
—Education is the first of the four E's that have to be there. Motorists have to be eduated about the size, speed, braking capability and crunching power of trains. But education alone is not enough. It has to be teamed with Enforcement and Engineering. (The fourth E is Evaluation.)

—Cooperation with law-enforcement agencies is vital. Police can be a big help in the educational process, and they can also write tickets so that crossing-law violators will pay attention to the education programs.

—Cooperation between Lifesaver's promoters and other departments within a railroad is no less vital, and this can go all the way from getting improved protection devices installed on a high-priority basis to cutting brush in order to improve visibility at a crossing.

—In order for it to produce long-term and lasting results, Lifesaver almost has to be a fire, fall-back and fire-again kind of thing, not a continuous campaign. Reason: Crisis prolonged becomes commonplace. Those who have been around Lifesaver for a long time are convinced that well-structured and concentrated campaigns every two or three years work better than long-running campaigns that can turn people off because of sheer boredom.

—Rail labor organizations, specifically the Brotherhood of Locomotive Engineers and the United Transportation Union, should be as involved as any or-



It all began on UP, which had a problem in Idaho. . .

Often, it's hard to establish the parentage of a good thing: Once it's known to be good, everybody's a Daddy.

But in the case of Operation Lifesaver (a proven good thing), there are no such problems: Daddy is Union Pacific, specifically Edwin C. Schafer, the now-retired general director-public relations and advertising of UP.

Ed Schafer recalls how it all started, going-on 10 years ago:

—UP had had a problem in Idaho for some time. Nothing in the way of traditional safety programs seemed to be working, and the problem was getting worse. UP was getting a bad name in the state. Worse, a lot of people were getting killed and injured.

—But then, a major meeting of law-enforcement officers was coming up, and Schafer saw an opportunity: "If we could bring them a program and enlist state aid, the impact would be a whole lot greater, because it wouldn't just be the railroad coming there with its sad tale." The police were receptive, knowing that they had no funds for a grade-crossing safety campaign and no real expertise, and knowing that a unified approach would work better.

—UP volunteered to develop a program and to support it with whatever it took, if the railroad could get state backing, which would—importantly—include a kickoff by the governor.

—This would be a program involving every UP department that had to be involved, most of which came under then-Vice President-Operations Bill Fox. Fox bought the program.

—Bill wasn't the only "fox" working for UP. Schafer made a particular point of promising the governor that UP would provide an assessment on how the lifesaving campaign was working, knowing that if state agencies knew the governor would know what was going on, those agencies would work to make the progam work.

—Any promotional campaign needs some kind of gimmick, and Ed Schafer went for the candy-with-the-hole-in-the-middle, the Lifesaver. Ergo, Operation Lifesaver. It took a bit of doing, to convince the candy company to lend its name to the campaign, but eventually Operation Lifesaver even had special wrappers on special packages.

13th St. grade crossing in Omaha, home of the railroad that initiated Operation Lifesaver.

Operation Lifesaver worked in Idaho. It worked in six states where UP began it. In every case, the casualty numbers went down. And, it could be assumed, in every case the image of Union Pacific went up. UP started Lifesaver in Idaho because it had a problem and because, at least in the biggest (southern) part of the state, it was all by itself and could control the situation; in other states, it invited participation from other roads, whatever kind of participation they wanted to engage in, while telling those roads that, whatever, UP would put Lifesaver in.

Today, Ed Schafer looks back on close to 10 years of Lifesaver programs and makes a few observations.

One is that programs have to be localized: The enforcement aspect is vital, he says, and there is no enforcement aspect in a "national" program.

Another is that Operation Lifesaver will not be effective if a total dependence is put upon obtaining freebies: There is some valuable exposure to be gained that way, he's ready to admit—between feature shorts in movie houses and public-service announcements on radio and television, maybe—but, as a professional in the business, he argues that the only thing television and radio stations and newspapers have to sell is time and space, and so Lifesaver proponents should be prepared to buy it. Union Pacific did.

A third is that Lifesaver has to be handled with intensity, but sporadically: Hit it hard, then leave it alone for a while, Ed Schafer says, meaning start it up, push it hard, leave it and then come back and hit it again.

Lifesavers, the candy-with-the-hole-in-the-middle, aren't really used so much as a symbol any more. Costs, one source says, are the reason. And that's too bad, because there could hardly be a better symbol. Besides, whether they helped prevent grade-crossing accidents or not, if you ever walked into a room where those peppermint candies were stored, boy, did they ever clear out your sinuses in a hurry.

ganizations in Lifesaver programs, and they are on a number of railroads; after all, it's their members who stand a chance of being killed or injured in virtually every grade-crossing accident.

—It would probably be a good idea for the first national Operation Lifesaver symposium to be followed by a second, a third and so forth. The first such meeting was held a few weeks ago in a Chicago suburb, and it did attract people from Maine to Texas to California, and it may have had value as a means of letting people share ideas. But it also seemed to prove that for various reasons, Lifesaver should continue to be a localized, state-by-state program with basic materials shared and adapted but with local control.

Market

CARLOADINGS

Loadings of revenue freight in the week ended Sept. 19 totaled 451,604 cars, according to the Association of American Railroads. This was a decrease of 673 cars, or 0.1%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Sept. 19 are estimated at 19.3 billion, an increase of 7.8% above the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity	**Sept. 19 week**	**Sept. 12 week**
Grain	27,090	21,508
Other farm products	4,015	2,850
Metallic ores	38,187	34,633
Coal	134,303	118,753
Crushed stone, gravel & sand	12,928	10,844
Nonmetallic minerals	14,296	12,457
Grain mill products	14,907	12,087
Food & kindred products	15,751	13,363
Primary forest products	18,333	15,136
Lumber & wood products (except furniture)	6,920	5,230
Pulp, paper & allied products	19,038	16,336
Chemicals & allied products	24,933	21,819
Petroleum products	5,258	4,492
Stone, clay & glass products	13,603	11,767
Coke	6,667	6,097
Metals & products	15,116	12,887
Motor vehicles & equipment	14,226	11,298
Waste & scrap materials	12,109	9,792
Forwarder & shipper assn. traffic	9,507	7,867
All other carloads	44,172	35,263
LCL traffic	245	166
Total Cars Loaded	**451,604**	**384,645**
Cumulative total,	1981	1980
38 weeks	**15,906,068**	**16,492,628**
Estimated revenue ton-miles (billions), 38 weeks	**675.1**	**664.9**

PIGGYBACK LOADINGS

U.S. piggyback loadings for the holiday week ended Sept. 12 totaled 28,433 cars (11.9% below the corresponding non-holiday week of 1980) and 52,068 trailers or containers (down 10.9% from 1980). Cumulative volume for the first 37 weeks of 1981 is 1,199,094 cars (up 1.6% from 1980) and 2,169,169 trailers or containers (up 0.9% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the ten-day period ended Aug. 31 totaled 6.6 million tons (down 11.6% from 1980). Cars loaded totaled 90,667 (down 13.5% from 1980). Cumulative loadings for 1981 were up to 168.9 million tons (down 4.4% from 1980).

- *Conrail.*—Is spending $2.6 million to expand and improve its Bayview TrailVan terminal at Baltimore. The upgraded Bayview terminal will absorb work now performed at Dundalk, also in Baltimore. Car capacity will be increased from 18 to 54; and trailer parking capacity will be increased to 800, almost double the present capacity.

- *PLM Railcar Maintenance Co.*—Received a contract from the Grand River Dam Authority, Vinita, Okla., for maintenance of 479 cars used in movement of coal out of the Powder River Basin; the work will be handled at PLM's Alliance, Neb., shops. The maintenance subsidiary of PLM, Inc., also announced renewal of a contract with Louisville Gas & Electric Co., for maintenance of 75 coal-carrying cars; this work is to be handled by PLM mobile units at Louisville.

- *Freight cars and locomotives.*—The following report has been received from the AAR and the ARCI:

DELIVERED

	August		**July**	**Eight months**	
	1981	**1980**	**1981**	**1981**	**1980**
Built new by carbuilders	2,971	6,158	2,864	31,132	55,730
Built new in RR shops	213	836	119	2,512	4,050
Built new—total	3,184	6,994	2,983	33,644	59,780
Rebuilt	65	18	47	763	023
TOTAL DELIVERED	**3,249**	**7,012**	**3,030**	**34,407**	**60,703**
Locomotives (new and rebuilt)	43	168	32	508	1,308

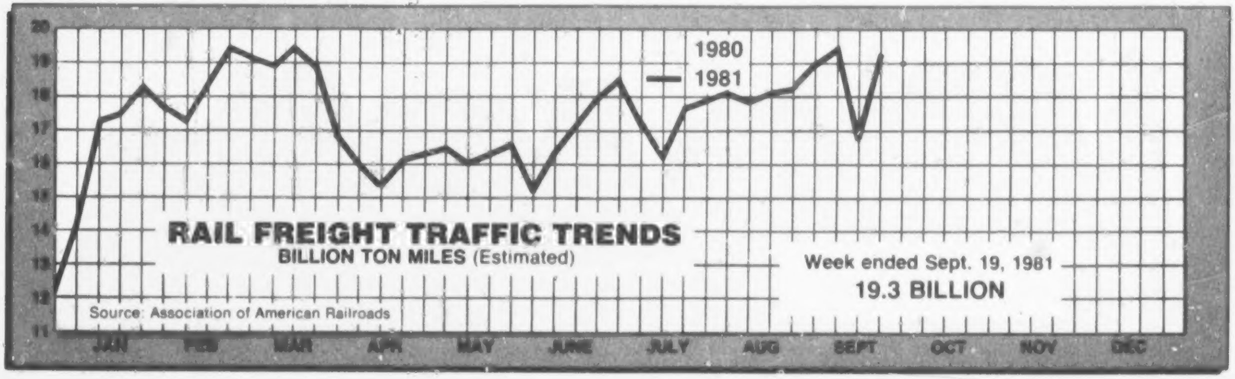
ORDERED

	August		**July**	**Eight months**	
	1981	**1980**	**1981**	**1981**	**1980**
To be built new by carbuilders	798	2,531	1,315	12,231	27,482
To be built new in RR shops	0	38	0	253	2,915
To be built new—total	798	2,569	1,315	12,484	30,397
To be rebuilt	0	194	0	1,100	1,063
TOTAL ORDERED	**798**	**2,763**	**1,315**	**13,584**	**31,460**

ON ORDER AND UNDELIVERED

	September 1		**August 1**	**Average backlog**	
	1981	**1980**	**1981**	**1981**	**1980**
To be built new by carbuilders	21,403	62,652	23,809	33,406	84,504
To be built new in RR shops	2,245	5,117	2,458	3,082	5,693
To be built new—total	23,648	67,769	26,267	36,488	90,197
To be rebuilt	337	240	402	316	354
TOTAL ON ORDER	**23,985***	**68,009**	**26,669**	**36,804**	**90,551**
Locomotives (new and rebuilt)	267	557	306	350	951

*Due to revisions and cancellations of some orders, the Sept. 1, 1981 backlog has been reduced by 233 cars.



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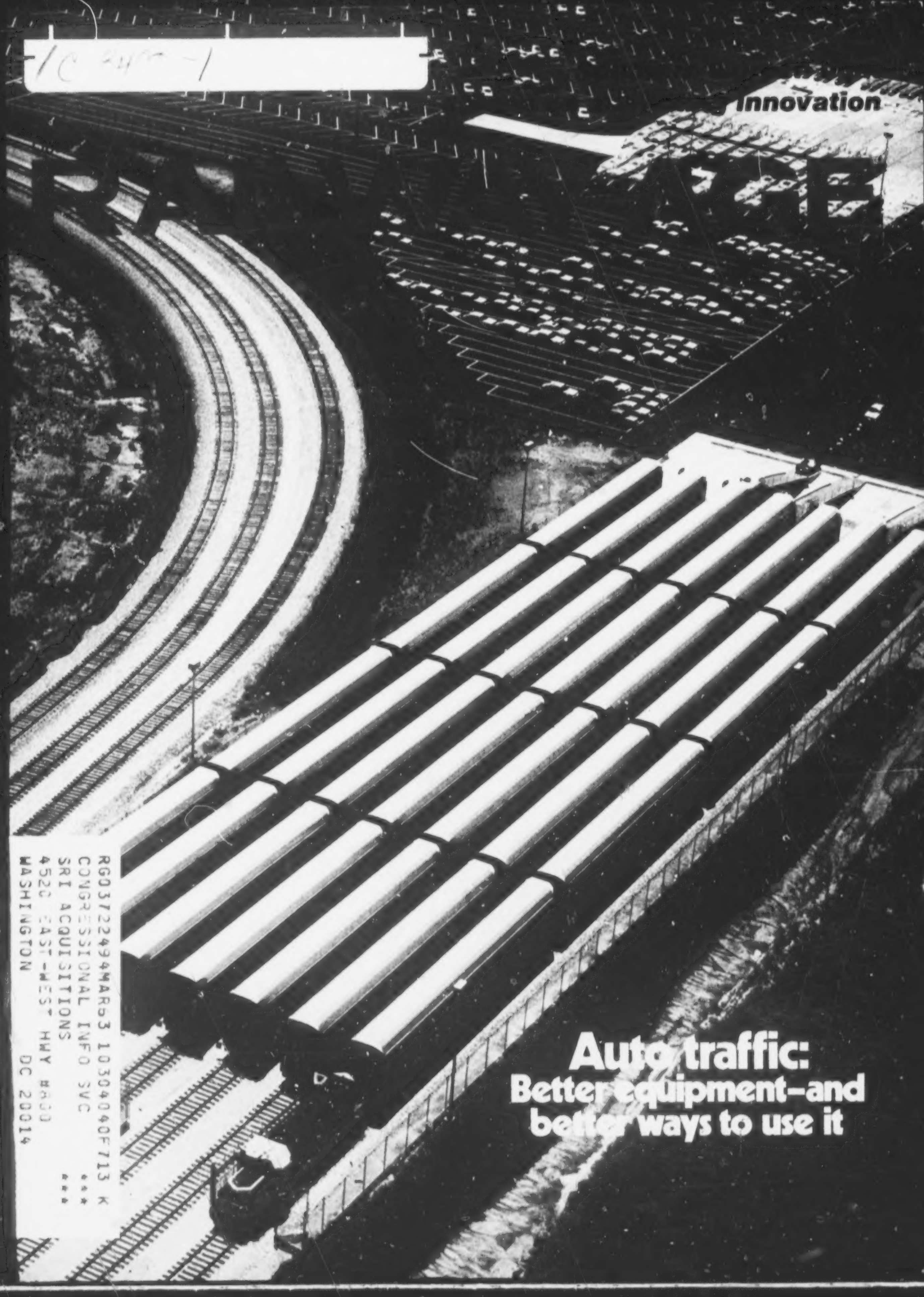

Innovation

Auto traffic:
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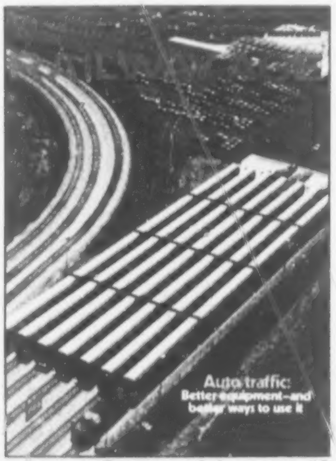
October 26, 1981

FEATURES



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Railroads and the auto industry

16 Auto racks: Pooling for profit
Historically, racks have been among the railroads' least-productive cars in terms of utilization. At the same time, racks have been getting more and more expensive. Now, with new reload/pooling programs in operation, equipment utilization should go up.

22 The fleet: Shrinking in size, growing in quality
Current forecasts are that motor-vehicle sales will go up in '82—and the cars and trucks moving to market by rail will be riding in the best equipment the railroads have ever been able to provide.

30 Marketing, Southern-style: The emphasis is on innovation
Southern has made its mark (and a fine one it is) in a time when railroads were strictly regulated. But ICC actions have changed the rules, and how does Southern feel about this? With its usual careful planning and aggressive selling of good service, Southern is confident it will prosper still.

42 UP's goal: A core-fleet of high-quality boxcars
Railroad ownership of boxcars has been declining and thousands of the remaining cars are in storage. Union Pacific, however, is spending $16.5 million this year to upgrade and rehab 3,185 RBL and XM cars. Why? Because there's a lot of high-quality freight out there that demands a high-quality car.

50 Deregulation plus one year: Reactions are mixed
It's been just about a year since the Staggers Act went into effect and deregulation became a fact. But, while trends do seem to be emerging, railroads, shippers and industry observers can't always agree on what those trends are or what they mean

NEWS

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COVER: Row upon row of auto racks loading up at the General Motors assembly plant at Oklahoma City. Photo by Orville Brent, system photographer, Santa Fe, Chicago.

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